

Evaluation of Risk of Work-Related Musculoskeletal Disorders in Professional Architects

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ABSTRACT

Musculoskeletal disorders are a common problem among the professional Architects. Many epidemiological studies have shown that ergonomic factors and aspects of work organization play an important role in the development of these disorders.

Study Objective: To evaluate the commonest regions affected in Architects using a self-made questionnaire and evaluate the risk level of body postures in Architects using Rapid Entire Body Assessment (REBA).

Methodology: Hundred professional Architects of both genders in the age group between 21-40 years were selected on the basis of inclusion and exclusion criteria. Self-made questionnaire was filled-comprising of demographic data, working hours, extra-curricular activities, prevalence of musculoskeletal disorders. Photographs of the subjects were taken in the sagittal plane while performing their drafting work with marking of anatomical points by markers and the measurement of the joint angles were performed using KINOVEA. Assessment of risk of musculoskeletal disorders was assessed using REBA Scale. The data was tabulated, coded and analysed for descriptive statistics using Microsoft Excel Worksheet.

Result: Our study revealed that Neck and Lower back are the commonest regions affected followed by shoulder and wrist and fingers in professional Architects with a medium risk of developing musculoskeletal disorders.

Conclusion: Our study demonstrated that, the commonest regions affected are neck and lower back followed by shoulder and wrist and fingers in professional Architects. The professional Architects have a REBA score of five which is predicted as medium risk to develop musculoskeletal disorders.

Key Words: Rapid Entire Body Assessment, KINOVEA, Musculoskeletal disorders, Architects, Computers.

INTRODUCTION

Musculoskeletal disorders (MSDs) refer to injuries affecting the soft tissues of the neck, shoulder, elbow, hand, wrist and fingers, cartilages and spinal discs. [4] These include the nerves (e.g. carpal tunnel syndrome), tendons (e.g. tenosynovitis and epicondylitis) and muscles (e.g. tension neck syndrome). Musculoskeletal disorders are a common problem among the architects. [4] Many epidemiological studies have shown that ergonomic factors and aspects of work organization play an

important role in the development of these disorders. [4]

The prevalence of musculoskeletal disorders reported in the United States has increased steadily within the past decade accounting for more than 65% of total occupational illnesses. [3] Several factors have been associated with work-related musculoskeletal disorders such as repetitive motion, excessive force, awkward and/or sustained postures, prolonged sitting and standing. [4]

The nature of work-related musculoskeletal disorders of the neck and upper limbs is reviewed using both scientific data and the consensus view of experts, union bodies and government agencies across the European Union. Work-related musculoskeletal disorders describe a wide range of inflammatory and degenerative diseases and disorders. These conditions result in pain and functional impairment and may affect, besides others, the neck, shoulders, elbows, forearms, wrists and hands. They are work related when the work activities and work conditions significantly contribute to their development or exacerbation but are not necessarily the sole determinant of causation.^[7]

The accurate measurement of workers' exposure to the factors that may contribute to the development of musculoskeletal disorders has been of vital importance to both epidemiologists and ergonomists conducting research studies. The magnitude of associations between occupational factors and upper extremities musculoskeletal disorders varies among studies due to different methods of exposure assessment.^[4] Investigators have used job titles, workplace observations of job tasks, checklists, self-reported exposures, hypothesized risk factors associated with certain tasks or occupations.^[4]

MATERIALS AND METHODS

STUDY DESIGN:

This was a cross sectional study following a purposive sampling involving a population of 100 professional Architects from Architect firms of Mumbai. The inclusion criteria adopted was male and female professional architects in the age group 21-40 years of age having a working experience of more than one year, excluding the architects having past surgical history, fractures and trauma of the dominant extremities and neuro-musculoskeletal disorders.

METHODOLOGY:

Approval was obtained from the Institutional Ethical Committee. Informed consent was taken from every participant and they were explained about the procedure. Self-made questionnaire was filled- comprising of demographic data, working hours, extra-curricular activities, prevalence of musculoskeletal disorders. Photographs of the subjects were taken in the sagittal plane while performing their drafting work or projects with marking of anatomical points by markers and the measurement of the angles at the joints were performed using KINOVEA. Assessment of risk of musculoskeletal disorders was assessed using REBA with respect to the joint angles calculated by KINOVEA. The above assessment findings were used to find out the risk of musculoskeletal disorders among the professional Architects.

STATISTICAL ANALYSIS:

The data was tabulated, coded and analysed for descriptive statistics using Microsoft Excel Worksheet.

RESULT

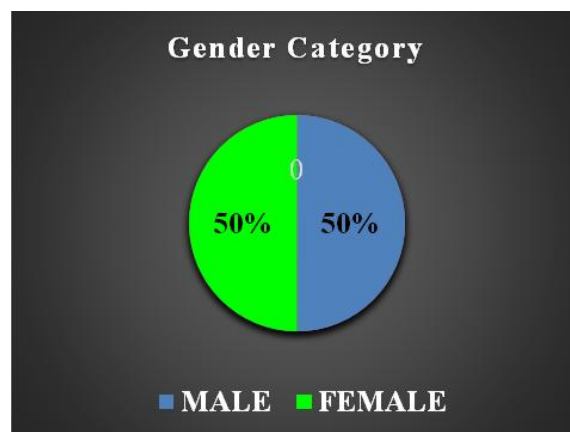


Figure 1: GENDER CATEGORY.

50% of male professional Architects and 50% of female professional Architects were included in this study.

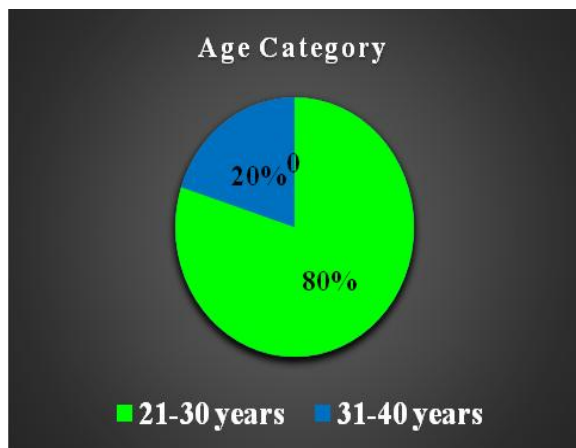


Figure 2: AGE CATEGORY.

Majority of the age group is 21-30 years i.e 80% and 20% for the age group of 31-40 years.

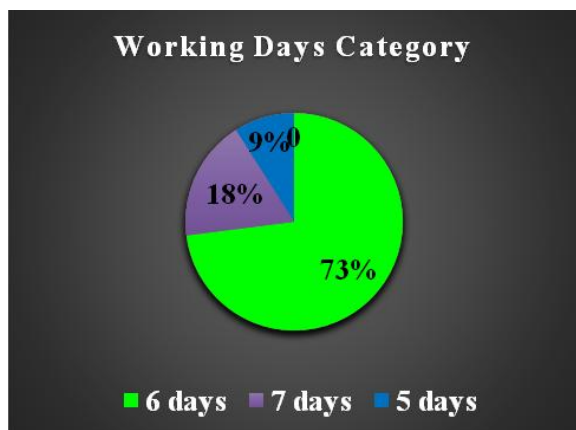


Figure 3: WORKING DAYS CATEGORY

Majority (73%) of population works 6 days per week, 18% of population works for 7 days and 9% of population works for 5 days.

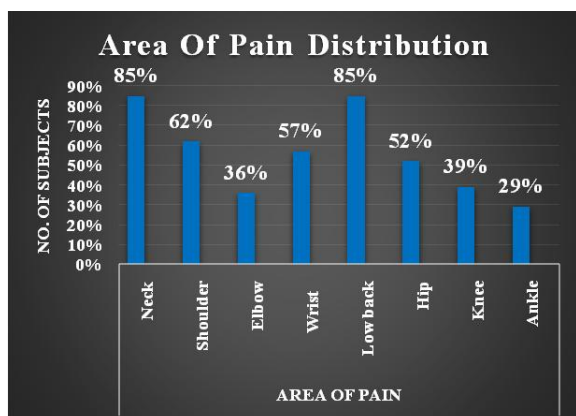


Figure 4: PERCENTAGE OF NO. OF SUBJECTS HAVING PAIN IN THE SIGNIFICANT AREAS.

Neck (85%) and Lower back (85%) are more prone to develop musculoskeletal disorders, followed by Shoulder (62%) and Wrist (57%).

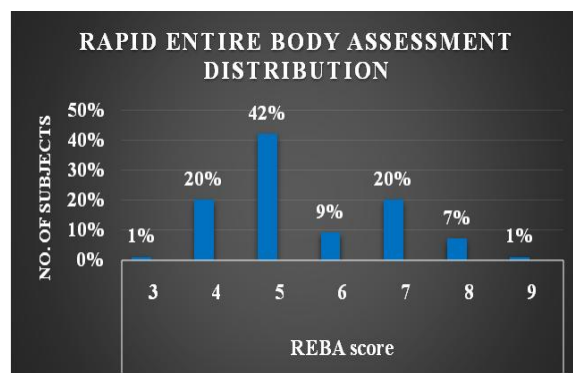


Figure 5: PERCENTAGE OF NO. OF SUBJECTS SHOWING THE REBA SCORES DURING WORKING HOURS.

Majority (42%) of the professional Architects have a REBA score of 5, 20% of professional Architects have a REBA Score of 4 and 7, 9% have a score of 6, 7% have a score of 8 and 1% of professional Architects have a REBA score of 3 and 9.

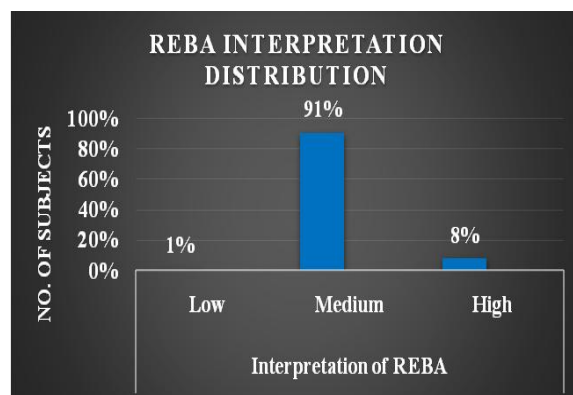


Figure 6: PERCENTAGE OF NO. OF SUBJECTS SHOWING THE RISKS OF MUSCULOSKELETAL DISORDERS.

Majority (91%) of the professional Architects are at medium risk to develop musculoskeletal disorders, 8% of professional Architects have a high risk and 1% have a low risk to develop musculoskeletal disorders.

DISCUSSION

The aim of the study is to evaluate the risk of work-related musculoskeletal disorders in professional Architects.

This study shows that, Neck and Lower Back are prone to musculoskeletal disorders more than Shoulder more than Wrist and fingers more than Hip more than Knee more than Elbow and then Ankle because of working on computers for prolonged hours and being in the static position with faulty postures can lead to risk of musculoskeletal disorders which correlates with the study done by Lorusso A, Bruno S, L'Abbate N. titled Musculoskeletal disorders among university student computer users.

Forty-two percentages of the Architects have a REBA score of 5 which is predicted as medium risk to develop musculoskeletal disorders.

In this study, we found that, ninety-one percentage of professional Architects have a medium risk to develop musculoskeletal disorders and further investigations should be done and changes should be implemented.

Neck and Lower back are the most common regions affected in eighty-five percentage of professional Architects.

According to the study done by Rempel Patt Tittiranonda, Stephen Burastaro, David, titled Risk factors for musculoskeletal disorders among computer users. Occupational Medicine: State of art reviews Vol 14. 1999, daily duration of computer use, time spent at the computer without breaks, duration of mouse use, poor workstation ergonomics, site visits can be the risk factors for developing musculoskeletal disorders. The height of the table and desk, the height of the professional Architect, backrest comes into consideration when we discuss about the neck and lower back problems.

Poor workstation ergonomics like screen of the computer not being at the eye level causes the person to go into forward head posture which causes Scapular, Sternocleidomastoid, Levator scapulae, Upper trapezius and Pectoralis Major and Minor to shorten and weakening of the middle and lower trapezius, rhomboids and

Thoracic Erector Spinae, leading to neck pain.

The head moves forward shifting the Centre of Gravity. To compensate, the upper body drifts backward and to compensate this drift, the hips tilt forward thus the forward head position can be a cause of midback and lower back problems. Also, poor ergonomics like improper backrest, height of the chair not adjusted to the screen and prolonged sitting can cause the person to go into slouched posture resulting into lower back pain.

CONCLUSION

Neck and Lower back are the commonest regions affected followed by shoulder, wrist and fingers in professional Architects. Forty-two percentages of the professional Architects have REBA score of five which is predicted as medium risk to develop musculoskeletal disorders.

Ninety-one percentages of professional Architects have a medium risk to develop musculoskeletal disorders and further investigations should be done and changes should be implemented.

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