



RESEARCH ARTICLE

EVALUATION OF WORK PRACTICES AND WORK-RELATED DISORDERS AMONG SELECTED HOSPITALITY INDUSTRY WORKERS- A PRELIMINARY SURVEY

¹Samuel S. E. and ²Bangera A.

¹Professor and Principal, Laxmi Memorial College of Physiotherapy, Mangalore, India

²Post Graduate Student (Corresponding author), Laxmi Memorial College of Physiotherapy, Mangalore, India

ARTICLE INFO

Article History:

Received 14th March, 2019
Received in revised form
17th April, 2019
Accepted 21st May, 2019
Published online 30th June, 2019

Keywords:

Ergonomics, Work related musculoskeletal disorders, Hospitality.

ABSTRACT

Background: Ergonomics plays an important role in safety and health of professionals in skill-based work stations. Work-related musculoskeletal disorders (WRMSDs) can affect almost all parts of the body especially the neck, back and upper limbs, depending upon the physical movement characteristics as well as ergonomic & mechanical design of work tasks. In order to ensure good practices at work it is necessary to understand the engineering and worker controls of professionals involved in heavy work demand and stressful work stations. Interdisciplinary areas of research need to be promoted among health care and hospitality industry. One of the areas of mutual interest is ergonomics. This paper would also help to identify potential areas of future research interest for those involved in research from both the disciplines. **Methods:** A preliminary survey was undertaken among 15 selected workers from a hospitality-based industry in Dakshina Kannada district. A semi-structured questionnaire was used to identify self-reported pain findings and demographic data. Rapid Upper Limb Assessment (RULA) was used for upper limb posture analysis. **Results:** Out of 15 subjects evaluated, 6 subjects (40%) complained of musculoskeletal pain- 3 subjects (20%) had low back pain and 3 subjects (20%) complained of lower leg pain which is intermittent in nature. RULA scale indicated that 6 subjects (40%) were at low risk and 9 subjects (60%) of workers were at medium risk for MSD. **Conclusion:** Lack of ergonomic awareness and poor work practices were found in the subjects of the present study. Results warrant implementation of proper knowledge among workers regarding proper posture and health education. There is a need to switch to ergonomically designed work stations with a focus to prevent WRMSDs.

INTRODUCTION

Work-related musculoskeletal disorders (WMSD) can affect various parts of the body especially the back, neck and upper limbs, which depend upon the characteristics of the movement, and the mechanical and ergonomic design of work task (Winkel, 1994 and Hales, 1996). Awkward working posture has been considered a risk factor related to musculoskeletal disorders (MSDs) in workplaces. Work-related musculoskeletal disorders (WRMSDs) is an important occupational problem for both developed and developing countries, with reduced productivity, rising costs of medical expenses and wage compensation and lower quality of life (Chaffin, 2000 and Karwowski, 2003). Occupational musculoskeletal diseases of the upper limbs can be defined as alterations of the muscle-tendon unit, of the peripheral nerves and of the vascular system. They can be triggered or aggravated by repetitive movements and/or physical strain of the upper limbs (Grieco, 1998). According to a recent review by Weevers HJ et al, the main reasons for work related consultations in general practice are musculoskeletal disorders, particularly low back pain, neck pain and shoulder pain (Weevers, 2005). Pain related disorders have a negative impact

on the ability and effectiveness of the work (Frank, 1996 and Blyth, 2003). Risk factors for work-related upper-limb musculoskeletal disorders have been grouped into the three main categories: (i) physical factors – repetition, force, posture and vibration (ii) psychosocial factors – job demands, job control and social relations at work (iii) personal factors – female gender, advancing age, lower socioeconomic status and pre-existing musculoskeletal disorders (Bernard, 1997 and Buckle, 2002). Ergonomics influences work professionals in skill-based work stations in hospitality. In order to ensure good practices at work it is necessary to evaluate the engineering and worker controls of professionals involved in stressful, heavy and repetitive work.

MATERIALS AND METHODS

Subjects working in food production department in a selected hotel in Dakshina Kannada district were examined for work related musculoskeletal disorders. Demographic data was collected and each participant was interviewed using a semi-structured questionnaire including self-reported pain related questionnaire. An observational analysis was done to evaluate work practices and engineering controls. Participants' upper limb postural analysis was done using RULA (Rapid Upper Limb Assessment) scale. The RULA ergonomic assessment tool considers biomechanical and postural load requirements of

*Corresponding author: Samuel S. E.,

Professor and Principal, Laxmi Memorial College of Physiotherapy, Mangalore, India

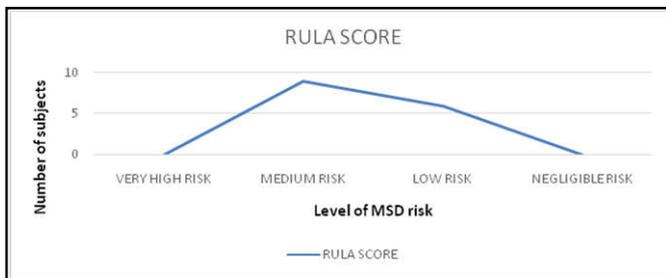
job tasks/demands on the neck, trunk and upper extremities. This scale is filled by the examiner by observing the worker's movements and postures during several work cycles. Selection of the postures is evaluated based on: 1) the posture sustained for the longest period of time the most difficult postures and work tasks (based on worker interview and initial observation), 2) the posture sustained for the longest period of time, or 3) the posture where the highest force loads occur (McAtamney, 1993). Score 1 is given to the range of movement or working posture where the risk factors are minimally present. Sites of the movement range with more extreme postures are allocated with higher score indicating presence of high-risk factors causing load on the structures of the body segment. The exposure scores according to RULA were divided into four 0, 1, 2, and 3 exposure categories: negligible, low, medium and high respectively (Table1). Medium and high-risk actions should be addressed immediately to decrease the level of exposure of risk factors (Ansari, 2014).

RESULTS

The study was done on 15 subjects working at different section of the food production department of a selected hotel in Dakshin Kannada District. The mean age of the subjects was 25.93±6.06 with average BMI of 23.85±3.25.

Table 1. Level of MSD risk based on RULA scores

SCORE	LEVEL OF MSD RISK
1-2	Negligible risk, no action needed
3-4	Low risk, change may be needed
5-6	Medium risk, further investigation, change soon
6+	Very high risk, implement change now



Graph 1. Level of musculoskeletal disorder risk among workers



Figure 1. worker bending and working to prepare wheat dough- Low level work stations used by workers



Figure 2. Worker forward neck bending posture.



Figure 3. Worker bending and picking up vegetables- Forward bending posture to collect items from storage

The average working hours was 8hrs. with scope for up to 3hrs (cumulative) break on typical workdays. Findings indicated poor knowledge, attitude and practices (KAP) in ergonomics among the subjects interviewed. Out of 15 subjects evaluated, 6 subjects (40%) complained of musculoskeletal pain- 3 subjects (20%) had low back pain and 3 subjects (20%) complained of lower leg pain which is intermittent in nature. RULA scale indicated that 6 subjects (40%) were at low risk and 9 subjects (60%) of workers were at medium risk for MSD.

DISCUSSION

This preliminary survey evaluated work-related musculoskeletal disorders and upper limb posture using RULA

(Rapid Upper Limb Assessment) scale among food production department workers. There were total 7 workstations for different cuisines of food (Chinese, North Indian, Sweets, South Indian, Tandoori, Pantry and Bakery) which included 1 chef and 2 helpers. Each work station consisted of two tables - gas counter and preparation table; both with non-adjustable table heights. Anthropometric measurements varied significantly among workers with height range of 152.4 cms to 170.18 cms and weight range of 50kg to 63 kgs. The height of the gas table was below the waist level for most workers and hence they had to bend while working, placing stress on the low back. 20% of workers complained of low back pain. Findings of the semi structured interview indicated poor knowledge, attitude and practices in ergonomics among the subjects. This selected job category involved mostly working only when orders are placed; standing continuously for approximately 2hrs. during a stressful time deadline to complete order. Workers did not involve in any healthy practices during the approximately 3hr break in between. Likelihood of fatigue the lower leg muscles appeared very high since the job demands more of standing; possibly explaining 40% of the workers complaining of leg pain of intermittent in nature and with Visual Analogue Scale (VAS) score of 3/10. Workers interviewed stated that pain did not affect their work practices, however this finding may be viewed with caution since RULA posture analysis showed that majority of the workers were working in medium and low risk of neck, upper limb and trunk injury. On observation, it was found that most of the workers had forward neck posture and reduced cervical lordosis – with long term consequence of early degenerative changes on account of abnormal pressure on the neck musculature and vertebra posed by such posture. Continued work in these postures may precipitate development of musculoskeletal disorders with potential to affect productivity and effectiveness in the workplace. Early intervention may be prudent to prevent WRMSD in this vulnerable population.

Conclusion

Lack of ergonomic awareness and poor work practices were found in the subjects of the present study. The selected workstations had poor scope for accommodating anthropometric variations of workers. Results warrant implementation of proper knowledge among workers regarding proper posture and health education. There is a need to switch to ergonomically designed work stations with a focus to prevent WRMSD.

REFERENCES

- Ansari, N. A, Sheikh M. J. 2014. Evaluation of work Posture by RULA and REBA: A Case Study. *IOSR Journal of Mechanical and Civil Engineering*, 11(4):18-23.
- Bernard, B.P. 1997. Musculoskeletal disorders and workplace factors. A critical review of epidemiologic evidence for work-related musculoskeletal disorders of the neck, upper extremity and low back. NIOSH Publication, 97-141.
- Blyth FM, March LM, Nicholas MK, Cousins MJ. 2003. Chronic pain, work performance and litigation. *Pain*, 103:41-47.
- Bongers, P.M., Kremer, A.M., and Ter Laak, J. 2002. Are psychosocial factors, risk factors for symptoms and signs of the shoulder, elbow, or hand/wrist? A review of the epidemiological literature. *American Journal of Industrial Medicine*, 41: 315-42.
- Buckle, P.W. and Devereux, J.J. 2002. The nature of work-related neck and upper limb musculoskeletal disorders. *Applied Ergonomics*, 33(3): 207-17.
- Chaffin DB, Andersson GBJ. 2000. Occupational biomechanics. *Sage journal*, 3(8): 33-39.
- Frank JW, Kerr MS, Brooker AS, DeMaio SE, Maetzel A, Shannon HS, Sullivan TJ, Norman RW, Wells RP. 1996. Disability resulting from occupational low back pain. Part I What do we know about primary prevention? A review of the scientific evidence on prevention before disability begins. *Spine*, 21:2908-17.
- Garden, F., Moore, H., and Jorm, L. 2005. The current and future health status of the New South Wales population. Sydney: NSW Department of Health.
- Grieco, A. G. Molteni, G. De Vito and N. Sias. 1998. Epidemiology of Musculoskeletal Disorders due to biomechanical overload. *Ergonomic*, 9(41): 1253 - 60.
- Hales TR, Bernard BP. 1996. Epidemiology of work-related musculoskeletal disorders. *Orthop Clin North Am*, 27:679-709.
- Jablonska, B, Soares J and Sundin O. 2006. Pain among women: associations with socio-economic and work conditions. *European Journal of Pain*, 10(5): 435-47.
- Karwowski W, Marras WS. Occupational ergonomics: principles of work design. Boca Raton, FL, USA: CRC Press 2003.
- McAtamney & Corlett. 1993. RULA- A survey method for the work-related upper limb disorders. *Applied Ergonomics*, 24(2):91-99.
- Savinainen, M., Nygard, C.H., and Ilmarinen, J. 2004. Workload and physical capacity among ageing municipal employees – a 16-year follow-up study. *International Journal of Industrial Ergonomics*, 34(6):519-33.
- Soares, J.J.F., Lundberg, U., and Grossi G. 2000. Gender differences in coping with musculoskeletal pain. *International Journal of Behavioral Medicine*, 7(4):305-21.
- Treaster, D.E. and Burr, D. 2004. Gender differences in prevalence of upper extremity musculoskeletal disorders. *Ergonomics*, 47(5):495-526.
- Waldenstrom. M et al. 2002. Assessment of psychological and social current working conditions in epidemiological studies: experiences from the MUSIC-study. *Scandinavian Journal of Public Health*, 30 (2):94-102.
- Weevers HJ, Van der Beek AJ, Anema JR, van der Wal G, van Mechelen W. 2005. Work-related disease in general practice: a systematic review. *Fam Pract*, 22:197-204.
- Winkel J, Mathiassen SE. 1994. Assessment of physical work load in epidemiologic studies: concepts, issues and operational considerations. *Ergonomics*, 37:979-88.
- Woods, V. 2005. Work-related musculoskeletal health and social support. *Occupational Medicine*, 55(3):177-189.
- Zetterberg, C. and Ofverholm, T. 1999. Carpal tunnel syndrome and other wrist/hand symptoms and signs in male and female car assembly workers. *International Journal of Industrial Ergonomics*, 23(3): 193-204.