

ASSESSMENT OF WORK RELATED MUSCULO-SKELETAL DISORDERS: CAUSES AND PREVENTION

Daniel Kebrit¹ and Dr. Sangeeta Rani²

¹Research Scholar, Debre Markos University, Ethiopia
Email: dan2007et@gmail.com

²Assistant Professor, Haramaya University, Ethiopia
Email: sangeetabhatt78@gmail.com

ABSTRACT

Musculoskeletal disorders are serious problems that every human being would face through the process of his/her life. Studies show that these problems frequently occur in work place. Nurses, construction workers and other longtime standing and sitting workers had been facing WRMSDs. There are personal and environmental reasons which would result MSDs in work place. Personal causes include poor physical shape, obesity, smoking and other drug abuse, workload (over load), poor postural consideration while lifting and lowering, sitting for long period of time (mainly computer users) etc. The major environmental causes are the use of inappropriate equipment (including working chairs, tables) and narrow working area (especially on office workers). Studies show that WRMSDs can be prevented by one or a combination of the following. Having good physical appearance or proper posture; working only what they can work(optimal load); be technical when lifting and lowering objects; use appropriate equipments and strengthen muscles and connective tissues by regular physical activity and proper nutrition.

Keywords: Muscular disorders, Skeletal disorders, Ergonomics

INTRODUCTION

Workers would face several problems at work place. It includes mental, social, psychological, physiological and physical problems. The World Health Organization (WHO) has characterized “work-related” diseases as multifactorial to indicate that a number of risk factors (e.g., physical, work organizational, psychosocial, individual, and socio-cultural) contribute to causing these diseases (WHO, 1985). The sum of these challenges affects the working capacity and decreases the satisfaction of the individual. Furthermore, it decreases the profit of the organizations. The focus of this paper is not to deal with all the aforementioned problems which workers face at workplace. Instead, the physical injuries, specifically musculoskeletal disorders which would occur at work place were addressed.

Musculoskeletal disorders (MSDs) are the most common work related health problems. For instance, when we see how the problem is serious in Europe. Across the EU 25% of workers

complain of backache and 23% report muscular pains. MSDs are the biggest cause of absence from work in practically all Member States (Zinta, 2008). In the United States, the most common types of non-fatal occupational injuries that result in days away from work are musculoskeletal injuries such as sprains and strains (Bureau of Labor Statistics, 2008). A similar problem had been observed in Brazilian workers. The most frequently affected body was the shoulder (49%; 95% CI 42.0–55.3), followed by the neck (47%; 95% CI 40.6–53.9) and back (39%, 95% CI 32.2–45.1) (Mussi and Gouveia, 2010).

This issue did not addressed in developing countries. In those countries, it may not be the reason for absenteeism from work. But, full of discomfort in the work place which is frequently seen in office workers is one result of MSDs. Work related MSDs are costly to business and also cause employee operating errors that result in substandard work quality and reduced operational productivity (Sang and Todd, 2010).

Every worker is exposed to work related musculoskeletal injuries such as low back pain, neck pain lower and upper limb injuries and shoulder problems. All the aforementioned problems are directly or indirectly related to movement. Although, it is impossible to control all the causes of those injuries, it is likely to decrease those causes significantly. A number of studies had been conducted on the prevention, treatment and rehabilitation of work place injuries. Their findings, which is believed to help workers, is reviewed in this paper.

OBJECTIVE

To Review Literatures on the Causes and Prevention of Work-Related Musculo-Skeletal Disorders

LITERATURE

Causes of Work-Related Musculoskeletal Disorders

There are three biomechanical risk factors that workers face; high force, awkward posture, and repetition. Any one of these hazards may lead to an MSD by themselves, however when two or more hazards are combined together, the risk for an MSD increases substantially (PSHSA, 2010)

The risk factors associated with the occurrence of WRMSDs are mostly related to biomechanical (uncomfortable posture at work) and psychosocial factors (lack of acknowledgement of work) and length of profession (Gisele and Nelson, 1994). The problem of WRMSDs is severe is nurses (Monica *et al.*, 1996; Bolanle *et al.*, 2010). Working in the same positions for long periods, lifting or transferring dependent patients and treating an excessive number of patients in one day were the most perceived job risk factors for WMSDs among Nigerian Nurses (Bolanle *et al.*, 2010).

Physiotherapy practice in Nigeria highly predisposes to WRMDs (Babatunde *et al.*, 2008). This was due to the conditions under which physiotherapists practice in Nigeria. According to Babatunde and his colleagues, Physiotherapy practice in Nigeria, like in many other developing countries is largely bedeviled by unwholesome work settings, understaffing and lack of appropriate equipments including those as basic as standard plinths. The use of inappropriate equipments, over functioning and working with unfitting posture leads them to different WRMSDs.

Some personal risk factors for MSDs such as smoking, being overweight, or in poor physical shape are the same factors as those relating to poor general health (Podniece, 2008) Among these, obesity is one of the top causes of WRMSDs. It has a significant impact on the musculoskeletal system being associated with both degenerative and inflammatory conditions (Ananda *et al.*, 2009). Work-life conflict is also one personal factor which would lead to MSDs (Oliver *et al.*, 2011). On the basis of cross-sectional data from a large-scale employee survey (6091 interviewed employees) in the service sectors of Zurich, Switzerland; they showed that WLC is significantly and quite strongly associated with MSD even when adjusting for various control variables (sex, age, education, physical activity) and other covariates (physical strain at work, time pressure at work, workload, job autonomy, general stress).

Prevention of WRMSDS

Various individual factors and physical and psychosocial work factors are related to musculoskeletal symptoms in the different body regions mainly neck, shoulders, low back, hands, and knees. Thus, the identification of risk factors might have far-reaching implications for the way in which effective health programs for prevention should be designed (Monica *et al.*, 1996). General health promotion at the work place might be one option to prevent MSDs (Podniece, 2008).

Avoidance of physical load primarily heavy physical work and prolonged sitting are the primary mechanisms for the prevention of low back pain which is the frequently occurring problem in work place (Eirra and Viicari, 1997).

Public Services Health and Safety Association Report on General Musculoskeletal Disorder Prevention (PSHSA, 2010)

1. If possible, lower rather than lift- Lowering loads from a higher to a lower level uses gravity as an advantage. This may help to reduce stresses placed on the body.
2. Always use the proper lifting technique
3. Push rather than pull- Pushing provides a mechanical advantage, since an individual's body weight helps to move the object. Pushing also allows for better body positioning, Reducing stresses on the musculoskeletal system.
4. Push or pull rather than carry. Pushing or pulling a load reduces stresses placed on the musculoskeletal system from carrying.
5. Work within the 'power zone'. The 'power zone' is typically considered the area between the shoulders and the knees. Doing work within this area maximizes the body's strength. Heavier objects should be stored in this area so that the body can more effectively handle them. Lighter objects may be able to be stored outside of the power zone.
6. Avoid awkward postures- Work should be designed so that most of it is done with neutral postures (Joints in their natural position).

CONCLUSION

Overall, this review study illustrates some the causes of WRMSDs and some tested mechanisms to prevent it. Depending on the findings of different investigations, this study is concluded as follows:

To be effective in work place, workers should be healthy both physically and mentally. Musculoskeletal injuries frequently occur in workers due to the aforementioned reasons. Every worker should keep his/her health, specifically physical health; by improving the range of motion of their joints through physical activity, strengthening his/her muscles, and listen to their body while working. On the other hand, the organizations should focus on implementing a comprehensive ergonomic program that includes both engineering and administrative controls to reduce the ergonomic risk factors for Work-related Musculo-skeletal disorder.

RECOMMENDATION

Depending on a number of research results reviewed on this paper conducted, the following points are recommended.

- Identify the causes of WRMSDs. Associate with your working environment. Then, minimize those factors which would lead you to MSDs.
- Avoid manual handling of heavy objects by employing technical solutions in the working process and, if it is not possible to avoid handling, there should be:
 - Adequate technical aids to reduce the loading of workers;
 - Training for workers on how to handle the loads.
- Use the suitable equipments and working tools. Organizations shall give attention to the make the working places comfortable for servants.
- Engage in regular physical activity. It helps you to increase the strength and endurance of your muscles; so that you can accomplish heavy tasks timely and with comfort. It is also important to increase the elasticity as well as the strength of connective tissues (ligaments and tendons). Hence, range of motion can be improved through physical activity. Furthermore, it provides proper posture; which is very important to prevent MSDs.
- Know the limits of your joints range of motion, Listen to your body! Whole body stretching before work and in the middle of workouts. Whether you are construction worker, Manufacturing worker or any office worker or a computer user. A number of Studies indicated that performing stretching exercises can contribute to reducing discomfort/pain and increasing range of motion (ROM).

REFERENCES

1. American Bureau of Labors Statistics 2008 report. Musculoskeletal disorders with days away from work, by nature of injury or illness. Accessed on June 5, 2013 from <http://www.bls.gov/iif/oshwc/osh/os/osbl0040.pdf>

2. Ananda, A. and F.L. March, 2009. Obesity and the musculoskeletal system. *Curr OpinRheumatol.* 21(1): 71-7
3. Babatunde, O.A., K.A. Ashiyat and L.O. Adewale, 2008. Work-related musculoskeletal disorders among Nigerian Physiotherapists. *BMC MusculoskeletDisord.* Vol. 9
4. Bolanle, M.S., E.M.Chidozie, L.O. Adewale and A.F. Ayodele, 2010. Work-Related Musculoskeletal Disorders among Nurses in Ibadan, South-west Nigeria: a cross-sectional survey. *BMC Musculoskeletal Disorders.* Vol.11: p12.
5. Chao, E., K.Y. Volokh, H. Yoshida, N. Shibaand T. Ide, 2010. Discrete Element Analysis in Musculoskeletal Biomechanics. *Tech Science Press.* vol.7 pp.175-192,
6. Duane.K., 2007. Fundamentals of Biomechanics. Springer Science and Business Media, LLC
7. Eira, R.A. and J.Viikari, 1997. The scientific basis for making guidelines and Standards to prevent work-related musculoskeletal disorders. *Jor.of Ergonomics.* Vol. 40: pp1097-1117
8. Gisele, M. and G.Nelson, 1994. Prevalence of work-related musculoskeletal disorders in Brazilian hairdressers. *Oxford JournalsOccu.Med.* Vol. 58: pp367-369.
9. Hoe, V.C., D.M.Urquhart, H.L. Kelsall and M.R.Sim, 2012. Ergonomic design and training for preventing work-related musculoskeletal disorders of the upper limb and neck in adults. *PubMed.* Vol.15:8
10. Holmstrom, E. & Ahlborg, B., 2005. Morning warm-up exercise effects on musculoskeletal
11. fitness in construction workers. *Applied Ergonomics.* Vol. 36: pp 513-519.
12. Oliver, H., K. Michaela, L. Thomasand F.B. Georg, 2011. Work-life conflict and musculoskeletal disorders: a cross-sectional study of an unexplored association. *BMC Musculoskeletal Disorders.* Vol. 12: p60
13. Podniece, Z., 2008. Work related musculoskeletal disorders prevention report. European Agency for Safety and Health at Work. White Chlorine Free Paper, Luxembourg
14. Public Services Health and Safety Association (PSHSA), 2010. Ontario, Canada; Musculoskeletal Disorders fast facts.
15. Sang, D.C. and W.Todd, 2010. Do Stretching Programs Prevent Work-related Musculoskeletal Disorders? Whitewater press. P 14
16. WHO, 1985. Identification and control of work-related diseases. Geneva, Switzerland: World Health Organization. WHO Technical Report Series. p714.