



EVIDENCE BASED SUSTAINABLE INTERVENTIONS FOR SAFER WORKING AMONGST OFFICE EMPLOYEES, PHYSICIANS AND PARAMEDICAL STAFF

Community Medicine

Dr Kishore P Madhwani*	Occupational Health & Wellness Consultant, Mumbai, Maharashtra, India. *Corresponding Author
Dr Amal Kumar Sinha Roy	Associate Professor, Dept. of Community Medicine, Malda Medical College and Hospital, W.B, India
Dr Samir Kumar Ray	Associate Professor, Dept of Community Medicine, Murshidabad Medical College, Berhampore, Murshidabad, West Bengal, India
Dr P K Nag	Rama Krishna Mission Vivekananda University, IRDM Centre, Narendrapur, Kolkata, India
Jitendra Kumar Singh	BSc., Research Associate, Sociologist, Kolkata, West Bengal, India

ABSTRACT

Background: Workplace design has a profound impact on the productivity of workers. Making the best use of space through optimum placement of equipment, integrating the human factor into workplace design, and effectively aligning the workplace into the surrounding environment are important aspects of ergonomics. Although a man sitting at his desk does not apparently give an impression of performing a toiling task, it is known to cause disorders that can have adverse effects on health due to static, constrained and awkward postures. **Objective:** The main objective of the study is to create awareness on safer use of Computers, and laptops Safer Working amongst Office Employees, Physicians and Paramedical Staff and also to educate the participants. **Materials and Methods:** A cross-sectional study was conducted from September 2018– April 2019, comprising Corporate office employees of multinational corporations selected from India, General & Occupational Health Physicians from India and one East Asian Country and Paramedical staffs from private hospital of India (n=725). Participants were trained using detailed training and short training. Feedback were recorded in a predesigned and pretested questionnaire. **Statistical Analysis Used:** Data collected were analyzed using the Statistical Package for the Social Sciences (SPSS) version and variables were compared using Chi-square and other test. **Results:** Out of 725 participants 370 (51.03%) were male and 355 (48.97%) were female. Amongst the participants 350 (48.28%) were office employees, 186 (24.83%) were General & Occupational Health Physicians and 195 (26.90%) were Paramedical staffs. Detailed training enhanced awareness >95% and short training >97%, the latter was much appreciated and educated more individuals **Conclusions:** All general practitioners and paramedical today share a responsibility to educate community on safer use of computer technology. Office employees can also play an important role to educate themselves first and then they can train family members or colleagues on this issue by becoming trainers (TTT- Train The Trainers).

KEYWORDS

Safer working, Office employee, Physicians and Paramedical Staff

INTRODUCTION:

Use of computers and hand-held devices increase risk of musculoskeletal disorders (MSDs). More time spent on this activity in faulty postures, higher the risk of acquiring them. Today, top priority is creating awareness on safe working postures and training individuals on sustainable behavior change to work ergonomically. Prolonged self-reported computer usage is the most consistently reported risk factor for computing-related MSDs across study populations.¹ These symptoms can be severe enough to limit daily and further result in disabilities that affect this next generation of workers' career and health.^{2,3}

Hence training interventions for ensuring wider coverage of office ergonomics awareness to promote safer working and suggesting sustainable programs for behavior change were explored. Musculoskeletal conditions affect more than 1.7 billion people worldwide, is the second largest cause of disability and ranks fourth in causing the greatest impact on overall health of the world population when considering both death and disability due to increasing use of computers, hand-held devices and smart-phones. This morbidity is increasing, as currently not only the IT industry, but modern day office-goers, our family members, students in colleges and children in schools are all using these devices, experiencing discomfort and even serious injuries necessitating physiotherapy, pain management and surgeries. While researchers are not yet able to understand why musculo-skeletal disorders occur. However, there is one general agreement; how a person positions his or her body during work and the amount of time the person is using these devices are extremely relevant and important. Armstrong (2009) clearly stated in his book that organizations could benefit from training and development through winning the "heart and minds of" their employees to get them to identify with the organization, to exert themselves more on its behalf and to remain with the organization.^[4]

Many organizations meet their needs for training in an ad hoc and haphazard way. Training in these organizations is usually unplanned and unsystematic. Other organizations however set about identifying their training needs, then design and implement training activities in a rational manner, and finally assess results of training.^[5,6,7]

It has been widely accepted that prolonged static, awkward and constrained postures during office work causes musculoskeletal stress on different body regions of seated workers, including call center operators and is a major factor in development of musculoskeletal disorders [popularly known as MSDs] such as pain in neck, back, shoulders and wrist, prolapsed inter vertebral discs, upper limb repetitive strain injuries, visual fatigue and mental stress, as observed in Nigeria and Thailand.^[8,9]

OBJECTIVES:

The main objective of the study is to create awareness on safer use of Computers, and laptops Safer Working amongst Office Employees, Physicians and Paramedical Staff and also to educate the participants so that they can train family members or colleagues on this issue by becoming trainers (TTT- Train The Trainers). In this way the training and awareness on ergonomics can be achieved widely.

METHODS:

A cross-sectional study was conducted (September 2018–April 2019), comprising 1] Corporate office employees of multinational corporations selected from India, 2] General & Occupational Health Physicians from India and one East Asian Country and 3] Paramedical staffs from private hospital of India. The participants (n=725) were divided into 2 groups to study the effect of interventions; (a) detailed training : forty minutes lecture by investigator with a power point presentation (n=622) using a mock workstation and (b) short training: live ten minute demonstrations (n=103) using a live workstation on office premises.

Data collected were analyzed using the Statistical Package for the Social Sciences (SPSS) version 20 and variables were compared using Chi-square and other test.

Results and discussion :

It was found that out of 725 participants 370 (51.03%) were male and 355 (48.97%) were female. Amongst the participants 350 (48.28%) were office employees, 186 (24.83%) were General & Occupational Health Physicians and 195 (26.90%) were Paramedical staffs. (Table 1)

Effective awareness on working safely with computers and hand-held devices was organized in different groups in 8 sessions. Maximum respondents were from the age group of 26-40 years 267 (36.83%) followed by 20-25 years age group 190 (26.21%), 41-60 years age group 145 (20%) and >60 years were 123 (16.97%). (Table 2)

Prevalence of musculoskeletal discomfort was more in man than women. Lower back pain was reports more i.e. 32.55% followed by upper back pain (27.03%), shoulder pain (18.76%), neck pain (18.21%), wrist pain (16.55%) and elbow pain (8.28%). (Table 3)

Feedback responses received from participants' on trainings, clearly indicate that percentages of total agree responses were high in all places i.e. >95% [Table 4], while total disagree percentage is very low i.e., below 5% in all the places. This clearly shows the remarkable success of the training which was highly efficacious in both office and community with respect to the training parameters including - simplicity and comprehensiveness, practicality, replicability and usefulness, knowledge enlargement, skills enrichment and inspiration to influence behavior modification.

When successfully implemented, 95% participants reported that these awareness sessions were extremely practical and useful, however they opined that the duration of training session could be shortened. (Figure 1)

While detailed training enhanced awareness >95% and short training >97%, the latter was much appreciated and educated more individuals. From statistical analysis, short training was found superior in providing comprehensive training and influencing behavior modification in India, however in other countries, it was found superior in knowledge enhancement, skills enrichment in addition to providing comprehensive training ($p < 0.05$). (Figure 2)

Work related musculoskeletal disorders (WMSDs) among office workers are receiving growing attention through different designs, trainings and activities.^[10,11] Approximately, 76% computer professionals from India, too reported MSDs (including pain in neck, back, shoulder and wrist) in various epidemiological studies^[12,13]. Sharan, *et al.*, 2011 studied work related musculoskeletal symptoms among computer professionals in India and reported that work style factors were significant predictors of pain and loss of productivity.^[14,15]

Table 1 : Distribution of Participants according to different sessions

Distribution of participants	Male		Female		Total	
	No	%	No	%	No	%
Office Employees	186	25.66	164	22.62	350	48.28
General & Occupational Health Physicians	98	13.52	82	11.31	180	24.83
Paramedical staffs	86	11.86	109	15.03	195	26.90
Total	370	51.03	355	48.97	725	100.00

Table 2 : Distribution of Participants according to their age

Age	Male		Female		Total	
	No.	%	No.	%	No.	%
20-25 years	98	13.52	92	12.69	190	26.21
26-40 years	136	18.76	131	18.07	267	36.83
41-60 years	74	10.21	71	9.79	145	20.00
> 60 years	62	8.55	61	8.41	123	16.97
Total	370	51.03	355	48.97	725	100.00

Table 3. Distribution of participants according to Musculoskeletal Discomforts (MSDs) (Multiple response)

MSD	Male		Female		Total	
	No	%	No	%	No.	%
Upper back	112	15.45	84	11.59	196	27.03
Lower back	128	17.66	108	14.90	236	32.55
Neck	76	10.48	56	7.72	132	18.21

Shoulder	72	9.93	64	8.83	136	18.76
Wrist	56	7.72	64	8.83	120	16.55
Elbow	36	4.97	24	3.31	60	8.28

Table 4 : Responses received from participants on detailed and short training on different variables.

SI		Disagree (%)	Agree (%)	Strongly Agree (%)	Total Agree (%)
Detailed training					
1	Comprehensive Training	3.54	8.47	87.93	96.4
2.	Knowledge enlargement	3.4	9.2	87.17	96.37
3.	Provided skill enlargement	2.8	14.93	80.83	95.76
4.	Productivity and replicability	2.67	6.1	90.4	96.5
5.	Behaviour influenced and modification	2.67	8.63	88.93	97.56
Short training					
1	Comprehensive Training	1.67	17.1	79.62	96.72
2.	Knowledge enlargement	2.07	24.6	72.7	97.3
3.	Provided skill enlargement	1.07	25.4	69.6	95
4.	Productivity and replicability	1.67	11.1	87.1	98.2
5.	Behaviour influenced and modification	1.07	17.4	80.87	98.27

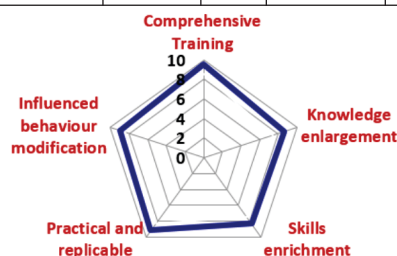


Figure 1 : Distribution of all respondents according to their opinion regarding different variables.

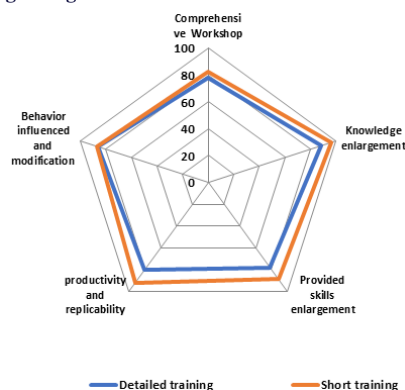


Figure 2 : Distribution of respondents according to their opinion of total agreement on all training parameters of detailed and short training.

CONCLUSION:

All general practitioners and paramedical today share a responsibility to educate community on safer use of computer technology. Office employees can also play an important role to educate themselves first and then they can train family members or colleagues on this issue by becoming trainers (TTT- Train The Trainers). In this way the training and awareness on ergonomics can be achieved widely. From the above description, it is evident that short ten-minute program is highly promising as it is practical, replicable, yields increased awareness with wider employee coverage in a much shorter time, instilling a feeling of

caring and confidence amongst them towards a robust office ergonomics program. This cost-effective technique could be used by all corporate offices globally to create office ergonomics awareness and influence behaviour modification for safer working.

ACKNOWLEDGMENT:

Authors are grateful to the respondents who participated in the study for their valuable support.

DECLARATIONS

Funding: Self funding

Conflict of interest: Nil

REFERENCES

- Gerr F, Marcus M, Monteilh C. 2004. Epidemiology of musculoskeletal disorders among computer users: Lesson learned from the role of posture and keyboard use. *J Electromyogr Kinesiol* 14:25–31.
- Katz JN, Amick BC, 3rd, Hupert N, Cortes MC, Fossel AH, Robertson M, Coley CM. 2002. Assessment of upper extremity role functioning in students. *Am J Ind Med* 41:19–26.
- Hupert N, Amick BC, Fossel AH, Coley CM, Robertson MM, Katz JN. 2004. Upper extremity musculoskeletal symptoms and functional impairment associated with computer use among college students. *Work* 23:85–93.
- Armstrong, M. (2009) *Armstrong's Handbook of Human Resource Management Practice*. 11th Edition, Kogan Page. Limited, London.
- Van Wely P. Design and disease. *Appl Ergon* 1970;1:262-9/
- De Wall et al. Li G, Buckle P). Current techniques for assessing physical exposure to work-related musculoskeletal risks, with emphasis on posture-based methods. *Ergonomics* 1999;42:674-95
- Green RA et al, *J Occup Health Safety Aust New-Zealand*. *Ergonomics*. 1990;6:109-18.
- Garavan, T.N. (1997) Training, Development, Education and Learning: Different or the Same? *Journal of European Industrial Training*, 21, 39-50. <http://dx.doi.org/10.1108/03090599710161711>.
- Berge, Z., Verneil, M.D., Berge, N., Davis, L. and Smith, D. (2002) The Increasing Scope of Training and Development Competency. *Benchmarking: An International Journal*, 9.
- Beardwell, N. and Holden, B. (1993) *Managing for Success*. 2nd Edition, Prentice Hall Publisher, England.
- Andersen JH, Kaergaard A, Mikkelsen S, et al. 2003a. Risk factors in the onset of neck/shoulder pain in a prospective study of workers in industrial and service companies. *Occup Environ Med* 60:649–654.
- Talwar R, Kapoor R, Puri K, Bansal K, Singh S. A study of visual and musculoskeletal health disorders among computer professionals in NCR Delhi. *Indian J Community Med*. 2009;34(4): 326–8
- Bakhtiar CS, Vijaya RS. Attitude alters the risk for development of RSI in software professionals. *Indian J Occup Environ Med*. 2003;7(1):7–10.
- Sharan, D, Parijat, P, Sasidharan, A.P, Ranganathan, R, Mohandoss, M, Jose, J. 2011. Workstyle Risk Factors for Work Related Musculoskeletal Symptoms Among Computer Professionals in India. *Journal of Occupational Rehabilitation*. DOI 10.1007/s10926-011-9294-4.
- Das, B and Ghosh, T. 2010. Assessment of Ergonomical and Occupational Health Related Problems Among VDT Workers of West Bengal, India. *Asian Journal of Medical Sciences* 1 (2010) 26-31