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Evaluation of Computer Workstation by Using Occupational Safety & Health Administration (OSHA) Self Assessment Checklist

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Abstract

Today, it is possible to carry out many of these activities using a computer without ever having to move from the workstation. In addition to this change in the nature of the work, there are more and more significant time constraints and complaints about various health problems that have begun to appear. Field survey was conducted on female employees working on Video Display Terminals (VDT) in different banks of Ludhiana District. Out of four zones of Ludhiana city, two zones were randomly selected. Out of each selected zone, 60 female employees in the age group of 25-35 years working in various private and nationalized banks as VDT users were purposively selected, thus making a total sample of 120 respondents. For evaluation of computer workstation by Occupational Safety & Health Administration (OSHA) a Self Assessment Checklist was used to know various Ergonomic Risk Factors for working conditions, seating, keyboard/input device, monitor, work area and general parameters. There were 33 questions under seven categories. It can be concluded from the above explanations that if work surface is too high, user has to raise her arms and shoulders which may be fatiguing and may also hinder blood flow, adding to discomfort and even the risk of injury. In addition, the wrist may be flexed (bent forward) to the keys, placing stress on forearm muscles and wrist tissues. Further, if the work surface is too low, the worker has to lean forward, placing stress on the arms and back.

Key words: *Video Display Terminals (VDT), Workstation, Occupational Safety & Health Administration (OSHA).*

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1. INTRODUCTION

Today, it is possible to carry out many of these activities using a computer without ever having to move from the workstation. In addition to this change in the nature of the work, there are more and more significant time constraints and complaints about various health problems that have begun to appear. India, being the forerunner in the cyber world, the health personals are slowly awakening to this group of modern occupational diseases, which are slowly taking roots, especially among the Video Display Terminal (VDT) users. The last two decades have witnessed a rapidly accelerating trend towards the application of Visual Display Terminal Technology for information management in the work places and homes, and a growing body of Scientific Community is in search of the implications of VDT use on the health and well being of its users **(Iqbal 2009).**

In terms of computer hardware, the placement of the monitor and keyboard are the key determinants of upper extremity posture while performing computer work. Head and neck positions are constrained by the visual demands and location of the monitor. Arm position is largely driven by the location of the keyboard and mouse (if used). The positioning of the keyboard relative to the user is a crucial factor affecting wrist posture and the risk of cumulative trauma injury **(Hedge *et al* 1996).** Thus, working posture is one of the most frequently cited risk factors for musculoskeletal disorders **(Armstrong *et al* 1993)**. The term musculoskeletal disorders (MSDs) refer to conditions that involve the nerves, tendons, muscles, and supporting structures of the body. Proper posture is considered to be a state of musculoskeletal balance that involves a minimal amount of stress or strain to the body. Therefore, evaluation of computer workstation used by female VDT users was evaluated by using Occupational Safety & Health Administration (OSHA) Self Assessment Evaluation Score Checklist.

2. METHODOLOGY

Field survey was conducted on female employees working on Video Display Terminals (VDT) in different banks of Ludhiana District. Out of four zones of Ludhiana city, two zones were randomly selected. Out of each selected zone, 60 female employees in the age group of 25-35 years working in various private and nationalized banks as VDT users were purposively selected, thus making a total sample of 120 respondents. The Occupational Safety & Health Administration (OSHA) Self Assessment Evaluation Score Checklist was used to evaluate computer workstation design used by selected female VDT users.

3. RESULTS AND DISCUSSION

Evaluation of computer workstation by Occupational Safety & Health Administration (OSHA) Self Assessment Checklist was used to know various Ergonomic Risk Factors for working conditions, seating, keyboard/input device, monitor, work area and general parameters. There were 33 questions under seven categories. This checklist is user friendly and does not take much time to collect information. The questions are simple and whenever "no" answer received it indicates that suitable changes are required for improving working postures. The detail for each statement and the number of respondents agreed for the statement has been presented. The OSHA minimum score was calculated as 33 and maximum of 66 (Fig. 1). Regarding the overall distribution of OSHA score, it was found that maximum number of respondents (77.50%) were

having medium level (44-55) of OSHA score followed by low level (22.50%) of OSHA score i.e. 33-44. No respondent was in the high level of OSHA score i.e. 55-66, which indicates that fault lies in one or other parameter of the workstation design of respondents.

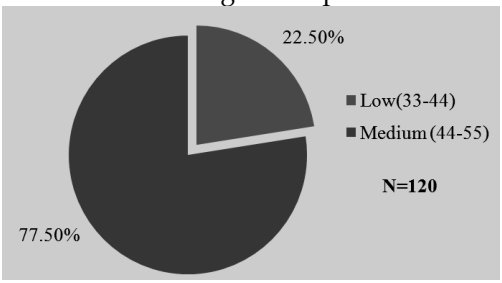

Fig. 1: Outcome of Occupational Safety & Health Administration (OSHA) Self Assessment Checklist

Evaluation with relation to working postures and accessories on the basis of OSHA Checklist Parameters

On the basis of OSHA checklist parameters, evaluation of workstation design was done with relation to working postures observed and accessories available at workstation. Certain deficiencies were found. The details along with explanation and reasons have been presented in Table 1.

Table 1: Evaluation of workstation design with relation to working postures and accessories (on the basis of OSHA Checklist parameters)

Working posture	Deficiencies in working postures and accessories
	• The head and neck is not upright in-line with the torso. • Placement of keyboard is not in keyboard tray • Low screen height. • Antiglare screen is not provided
	• Improper usage of the keyboard tray • Wrists are resting on sharp wooden edge. • Wrists are elevated in order to perform typing and the fingers touch the front edge of the table surface. • Arm rest is not provided • Mouse pad is not provided • The space between the keyboard tray and thigh is not enough

Working posture	Deficiencies in working postures and accessories
	• Legs and feet are not having clearance space under VDT table. • Feet are not resting on the floor as footrest was not provided. • The back of the knee is touching the front edge of the seat pan.
	• Inadequate storage space leading to unorganized workstation • Drawers are not provided to keep the files • Document holders are not provided. • Chair does not have arm rest
	• Deep drawers leading to awkward working posture. • Placement of monitor is far away • Poor condition of the chair. • Inadequate light in the working area. • Improper placement of computer wires creating obstruction • Small cabin area
	• Cervical extension due to wearing of bifocals (a) • Chair is without arm rest (b) • Footrest is not provided (a, b, c) • Glare on the screen due to wrong positioning (c)

It can be concluded from the above explanations that if work surface is too high, user has to raise her arms and shoulders which may be fatiguing and may also hinder blood flow, adding to discomfort and even the risk of injury. In addition, the wrist may be flexed (bent forward) to the keys, placing stress on forearm muscles and wrist tissues. Further, if the work surface is too low, the worker has to lean forward, placing stress on the arms and back. **Hibibi (2001) and Sarkar and Samanta (2007)** also found that various risk factors for musculoskeletal problems were specifically related to the nature or design of VDT work and workstation. Therefore, it has been suggested that with certain modifications of the workstation design and improvement in work organization the prevalence of these risk factors can be reduced to a great extent.

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