
Computer Vision Syndrome and Musculoskeletal Disorders among call of a private company center workers

Thesis

Submitted for partial fulfillment of master degree in
Occupational and environmental medicine

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Dedication

This work is dedicated to my father soul, my mother who tolerates exile and stayed by my side supporting and encouraging me, to my brothers and sister who were always supportive, and to my friends for encouraging me to finish this study.

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Protocol of Thesis

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Protocol

Introduction

The development of computer and information technology is perhaps one of the most dominating factors in the ever-changing working life of today.

Call centers (CCs) are a rapidly growing industry in many countries. It is estimated that, in South East Asia and India, the annual growth of CCs is 50 %. Approximately 37 % of all new jobs within Europe during recent years have been in CCs (*Norman, 2005*).

There is no universally accepted definition of “call center” or “operator”, although the following ones have been suggested: Call center – is a work environment in which the main business is conducted via the telephone whilst simultaneously using display screen equipment (*Health and safety executive. UK, 2014*), or an office in which large numbers of telephone calls are handled, especially one providing the customer services functions of a large organization (*Oxford dictionary, 2014*).

Call center operator (also known as customer service advisor/agent/handler) – is an individual whose job requires them to spend a significant proportion of their working time responding to

calls on the telephone whilst simultaneously using display screen equipment (*Health and safety executive.UK, 2014*).

The work at Call Center includes not only attending telephone calls, but also includes handling various types of interactions. Thus, the functions of Call Center Work include: Work Force Management, Technology Management, Financial Management, Quality Management and Reporting and Communications (*North American Quit line Consortium, 2010*).

Communications skills, responsibility and efficiency are expected from operators under the influence of time pressure, ambitious goals and sometimes direct monitoring of performance, Call center services generally comprise one of the following two types:

- The first type (inbound services) deals with incoming customer calls, with the workers providing customer services.
- The second type (outbound services) conducts simple sales activities or market surveys on prospecting for new clients.

Call center workers are at risk of developing many work related illnesses such as computer vision syndrome (CVS) and musculoskeletal disorders (MSD).

Mvungi et al (2008) reported that most problems associated with the use of the computer can be largely attributed to improper use of computers and most importantly, insufficient knowledge about safe computer usage techniques and practices.

Musculoskeletal disorders (MSDs) are injuries or disorders of the muscles, nerves, tendons, joints, cartilage. Disorders of the nerves, tendons, muscles and supporting structures of the upper and lower limbs, neck, and lower back that are caused, precipitated or exacerbated by sudden exertion or prolonged exposure to physical factors such as repetition, force, vibration, or awkward posture. (*CDC, 2014*).

Several studies have shown that long periods of constrained sitting or computer work are associated with musculoskeletal symptoms (*Norman, 2005*). In 2003/04, MSDs (bone, joint or muscle problems) were by far the most commonly reported work-related illnesses in Great Britain, with an estimated 1,108,000 people ever employed affected (*Health and safety executive.UK,2014*).

In 1994, *Hales, et al.* reported increased prevalence of upper extremity work-related MSDs among telecommunication workers who used Visual Display Terminal (VDTs). Among these work-

related MSDs, tendon-related disorders were most common, followed by muscle-related disorders, nerve entrapment, joint related problems and ganglion cysts. Hand–wrist was the area most affected, followed by the neck, the elbow and the shoulder areas

Computer vision syndrome (CVS) is another health problem affecting call center operators, it is characterized by a complex group of eye and vision-related problems that result from prolonged computer use (*Bali et al., 2007*).It occurs because the eye and brain react differently to characters on the screen than they do with printed characters; it is difficult for eyes to remain focused. Having to continuously refocusing on digital text fatigues the eyes and can lead to burning or tired eyes (*Akinbinu and Mashalla September, 2013*).

It is marked by symptoms such as eyestrain, burning sensation, blurred vision, gritty sensation, headache and neck pain. *Chiemeke et al (2007)* said that some computer users may experience continued reduced visual abilities such as blurred distant vision even after work. Most CVS-related problems can be avoided by appropriate preventive measures, but the majority of computer users are not aware of CVS-related symptoms while some choose to ignore them (*Divjakand Bischof,2009*).

A survey of doctors of optometry found that more than 14% of their patients present with eye or vision-related symptoms resulting from Visual Display Terminal work (*Sheedy, 1992*).

These symptoms may be aggravated by poor lighting, glare, improper work station set up and uncorrected refractive errors (*Ihemedu et al., 2010*).

Multifactor models suggest that work-related risk factors can result from the work tasks and their performance, as well as from the organization of work, and the physical and psychosocial work environment.

Frequent rest breaks provide benefits of reducing musculoskeletal and visual discomfort for computer users (*Taylor and Green, 2008*).

Another study showed increased productivity following ergonomic improvements (*Smith et al., 2003*).

The goal of ergonomics is to reduce stress and eliminate injuries and disorders associated with the overuse of muscles, bad posture, and repeated tasks. This is accomplished by designing tasks, work spaces, controls, displays, tools, lighting, and equipment to fit the employee's physical capabilities and limitations.

Since few studies have addressed these problems in Egypt, especially on call center setting, this study will determine CVS and MSD symptoms among call center workers of a private company.

Aim of the work

Goal:

The goal of this study is to attempt to reduce the occurrence of computer vision syndrome and musculoskeletal disorders among call center workers.

Objectives:

1. To determine the self-reported computer vision syndrome and musculoskeletal disorders symptoms among a private company call center workers.
 2. To identify the relation between adherence to ergonomics in the private company call center settings and computer vision syndrome, musculoskeletal disorders occurrence.
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Methodology

Study Design:

Observational cross sectional study.

Study Setting and population:

The study will be conducted in a private company call center in Abbasyea district.

A sample of 196 was calculated using prevalence of reported musculoskeletal disorders among data processing workers (*Valerie Woods, 2005*), equals to $85\% \pm 5\%$ and confidence interval = 95%. The sample was calculated using Epi Info 2002 program. Since the total number of workers in the mentioned setting is 202, they will be all involved in the study.

Study tools:

- A self-reported questionnaire will be administered to all participants. The questionnaire will be designed by the researcher through using a modified translation to Arabic for selected questions from questionnaires of many previous thesis and questions added by the researchers. Translation and modifications will be done by the researcher.
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- The questionnaire will include questions about:
 1. Socio-demographic data (age, gender, education level)
 2. Questions about occupational history (duration of employment, weekly work hours, job description...).
 3. Self-reported Symptoms of computer vision syndrome and musculoskeletal symptoms.

 - OSHA evaluation checklist will be used once to evaluate each operator work station. (*OSHA computer workstation -etools, 2014*).

Methodology

A pilot study will be carried out to test the study tool on 10 workers in the study setting.

Evaluation of the work station will be done first by the researcher using the check list, and then the questionnaire will be given to the worker.

Data Management:

- Data will be collected, revised, coded and entered on a personnel computer .SPSS program will be used and suitable statistical tests will be applied.
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Ethical consideration

- Approval from the private company administration will be taken.
- Approval from the research ethical committee, faculty of medicine Ain Shams University will be taken.



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