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WORKING WITH DISPLAY SCREEN EQUIPMENT: HEALTH PROBLEMS AND PREVENTIVE MEASURES

Chibuzor Chika and Alete Favour Ndidi
Department Of Human Kinetics Health and Safety Studies, Ignatius Ajuru University of Education Rumuolumeni

Abstract: The number of persons working with display screen equipment is constantly growing with many training to master the use of display screening equipment. Unfortunately, mane of the users are unaware of the health problems associated nor armed with measures to protect themselves against the numerous health problems. And the situation is worst in developing countries where Occupational health safety guidelines are poorly implemented, enforced and practices by industries. Hence, this paper explored the various health problems associated with the use display screen equipment with proper illustrations as well as proffered practices solution to preventing, controlling the health problems and the protection of the workers both small, medium and large-scale industries. It was also suggested among others that Proper health and safety training must be made available for all work stations which will basically Include how to adjust furniture and the most correct and comfortable way to sit while using the work station and employers should make available to their employees, ergonomic DSE work stations to help reduce the negative effect of work on the employees.

Keywords: display screen equipment, workers, health problems, preventive measures

Introduction

The digital and information revolution has changed the way the world learns, communicates, does business, and treats illnesses. New information and communications technologies (ICT) offer vast opportunities for progress in all walks of life in all countries - opportunities for economic growth, improved health, better service delivery, learning through distance education, and social and cultural advances.

As such, there has been an increase in the rate at which the DSE is being purchased by individuals and organization for academic, medical, personal and mostly for commercial use for finance generation. The use of DSE has offered a platform for unemployed youths to get work to make ends meet and as such has increased the number of people who work with the DSE full time. This has made the number of people who are at the risk of these health problems to spike, (Akinbinu & Mashalla, 2014) posited that the invention of DSE has revolutionized in a big very involving most DSE users and the level of performance at work. Since the duration of training on the application and appreciation of DSE is short means to get training and employment.

DSE workstation can be associated with neck, shoulder, back or are arm pain, as well as with fatigue and eyestrain. Surveys have found that large number of DSE users report aches, pains or eye discomfort. These aches and pains are sometimes called upper limb disorders (ULDs), which can include a range of medical conditions such as RSI. These conditions do not indicate any serious ill health, but it makes sense to avoid them as far as

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possible. The Health and safety (Display Screen Equipment) Regulations 1992 aim to protect the health of people who work with DSE. The Regulations were introduced since DSE has become very common kinds of work equipment. That doesn't mean that DSE work is a risky one, it isn't. ULDs is easily avoided as far as DSE users follow effective DSE safety practices, set up their workstations properly and take breaks during prolonged use. By just a few simple precautions, work with DSE can be more comfortable and productive. (HSE; health and safety executives 2012).

DSE users can experience a lot of different physical and psychological health problems which includes short term myopia, blurred vision, headaches stress, mental stress, musculoskeletal problems including RST, and reproductive hazards. These problems are a resultant of combination of poorly by designed jobs, equipment. These conditions can be prevented by giving attention to the ways jobs are organised and provision of appropriate equipment and workplaces; ensuring people are not required to do too much work in a short time. The Health and Safety (Display Screen Equipment) Regulation came alive January 1993 (while small changes were made in 2002) which require employers to minimise the risk of DSE work by ensuring that work environment and jobs are well designed, DSE users have adequate rest time and are not subjected to oppressive monitoring. Workers defined as DSE users under the regulations have the right to ask their employer to provide and pay for an eye and eyesight test, this is a test by an optometrist or doctor. There is also an entitlement to further tests at regular intervals.

Nigeria is a nation with over 200 million population (National Health Survey [NHS], 2020) and perhaps the largest market for ICT tools most especially display screen equipment. As at 2017, Nigeria spent over 3.27 million dollars (that is over 1 trillion naira) on the importation of computers and its accessories for use across all the industries. Furthermore, over 26% of the imported computers were fairly used computers with higher radiation potentials (World Bank [WB], 2020). In Africa, Nigeria is second to none in computer use with over 30% of her population reportedly working with display screen equipment (Statista, 2021). The imperative understanding in this, is that display screen equipment are in large use in Nigeria. Also, as earlier claimed, the use of display screen equipment has lubricated the work process. Thereby infusing higher efficiency. Nevertheless, the health consequences that comes alongside the constant use of these equipment are numerous and often time not communicated to the workers by the employees as proposed by Percival Pott (Abboud, 2017; Achalu, 2020).

The practice and use of DSE has been abused and this has led to the arousal of so many hazardous conditions due to unsafe conditions which these DSE users engage in and are faced with in the cause of their work and when using the DSE. Researchers have proven that there are a lot of health issues affecting DSE users. And these health problems will continue to trend if proper measures are not put in place to control and minimise them or even stop them. A survey of DSE users conducted in 2017 by institute of occupational medicine for the health and safety executive found out that; 75% of users suffered from shoulder, back or neck pain, 60% of users suffered from eyestrain while 50% of users suffered from headaches. It is against this background, that this paper explored working with display screen equipment: health problems and preventive measures.

What is Display screen Equipment?

Display Screen Equipment (DSE) is any device or equipment that possesses an alphanumeric or graphic display screen, regardless of the display process involved; it includes both conventional display screens and those used in emerging technologies such as laptops, touch screens and other similar devices.(Health and safety executives HSE 2012), the medical school (2012) defined DSE as an alphanumeric or graphic display screen, regardless of the process involved. This means that DSE is no longer limited to only desk tops and laptops but also

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now includes even the mobile phones, tablets, palm tops and so on. That is anything that has a display screen and can show graphic images, letters, characters and so on.

The computer desktop encyclopaedia (2016), defined display screens as platforms or surfaces area on which texts and graphics are temporarily made to appear people to view its either a CRT (cathode ray tube) or flat panel technology which is either LED or LCD (light emitting diode or liquid crystal display respectively) According to the Scottish Centre for Healthy Working Lives (2016), display screen equipment is any visual display units or computer work stations which include all computerised devices ranging from; laptops, desktops, touch screen and other related gadgets.

The Health and Safety Team of the Edinburg Napier University (2016), defined Display screen equipment (DSE) as not limited to typical office situations consisting of computers, laptops and related technologies (i.e handheld devices like Blackberries) but also covers, for example, non-electronic display systems such as microfiche. User The combination of factors which give rise to risk makes it impossible to lay down hare-and -fast rules about who should be classified as a user or operator. "users" are employees who habitually use DSE for their job. Where use is less continuous or frequent the employee is classed as an "operator" of DSE (and not a "user" as defined in the Regulations). Bothe operators and users should complete DSE assessments. It will generally be appropriate to classify the person as a user if they: use DSE for continuous or near-continuous spells of an hour or more at a time, use DSE in this way more or less daily, have to transfer information quickly to or from the DSE, need to apply high levels of attention and concentration; or are highly dependent on DSE or workers should be assessed using the same criteria. For example, if an employee works only two days a week but spends most of that time on DSE work, that person should be considered a user.

1. All employees who have access to display screen equipment (DSE), whether or not they are considered to be users, should complete the Cardinus online Workstation Safety Plus package
2. Completion of the Workstation Safety Plus package is also needed where employees work from home (whether or not the employer provided the workstation).
3. Where there is a computer without an identified user (for example in hot desking situations or for a computer used by the public in a library) and assessment of the workstation must be undertaken to ensure it is suitable, adjustable, and safe for the required users.
4. You must reduce risk identified in the assessment as much as possible.

Who works with Display Screen Equipment (who DSE Users)?

There are divers of workers that work with display screen equipment. Such workers are reffered to as DSE users. A DSE user is an individual who habitually uses DSE as part of their daily lives or normal work routine for a long period of hour in a day or a person who uses DSE as an important part of their work. Where use is less continuous or frequents the employee is classified as an "operator" of DSE (and not a "user" as defined in the regulations). An employee who works only two days a week but spends most of that time on DSE work, that person should be considered a user. (Health and safety executives HSE 2012).

Work station is an assembly of the DSE, any furniture, working surface, printer, document holder or other items peripheral to the DSE and its immediate working environment within the DSE e.g. lighting, ventilation, noise, etc.(Occupational safety and health 2009).

(Margaret, 2005), defined a work station as a computer intended to for individual use that is faster and more capable than a personal computer. It's usually for business or professional use rather than home or recreational use.

Types of display screen.

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There varied display screen equipment used by different workers for different purposes. Verma (2012), explained the different types of display screens as follows;

CRT: CRT simply means Cathode Ray Tubes and it is an old style display which uses the florescent blue tube in itself to projects the electrons to the screen at a time. These projections are responsible for creating the images on the screen, these monitors are pretty heavy and have been configured for some various sizes,. They are available in the sizes of 15 inches, 19 inches and the 21 inches.

LCD: it is the very common type of the display that one can find anywhere. This contains the liquid crystals and these displays do not contain the tubes. So, there isn't any electronic gun as well and one doesn't have to worry about the electrons painting the display. Instead, there is a back light that always keeps the liquid crystal display on. The power is given to a transistor which then repolarises light and that's what enable the light to come out and show a specific colour. Since there is always a light that is shining through, the LCD displays do not contain the black set blacks. Also, if one does lots of the graphical work and hence the lot of work have to be shown one should ensure that the back light is always there and quality of LCD is pretty high.

LED: LED is another new technology which also has captured many of the consumer's choices. It known as led since the backlight used in it is normally a fluorescent light and it is used instead of using a normal backlight. But, there is always the LCD there which gives the screed information and helps us having the view. So, it's even better if it is called LED Backlit LCD. The LED technology has been embedded in many ways. One of the ways is to have the LEDs at the edge of screen. Inside the display, there is a component named diffuser which is responsible for the distribution of the light that comes through the whole back. Another method to use this technology is the usage of a whole array of LEDs. This array isn't just there on the edges, but they are spread across the all backside of the display. Hence the display gets lighter since it has more control of it. There is new type of LED too which has been introduced. It's called the organic LED display. It is created of some organic material which lights up if it is provided with a current. The cost of such LED is pretty low and this LED is mostly used in the mobile phones due to it fast speed and the good response time. The angel of viewing is also pretty wide it all happens since the material used inside it is pretty organic.

PLASMA: this is another new invention and it is named as the plasma display since there are some really small sized cells are present there. These cells are of the Nobel gases and when the voltage is provided to them the ultra-violate ray is generated and the each light is brightened and hence the light is emitted through the display. Now, the phosphorus is being used instead of these cells and hence the colour quality has been improved a lot. so for those who work for the video editing and they require some goods displays, this one is the good option.

PROJECTOR: This projectors are now also being used and almost every organization use this to spread the information on the screen. The data can be projected at the wall and it can become visible to many people at the same time. These are also known as the CD projectors but he truth is that there are many various technologies which are being used for that displays and the LCD is not the only option.

OLED: This screen type is a new technology. OLED means Organic Light Emitting Diodes. It is the flat light emission one and it is made through some thin films which are organic and they are placed between two conductors. Whenever it gets hit by the electricity, the bright light comes out of it. These displays do not require some backlight and they are pretty thinner. Sometimes, they are better than all the LED and the LCD since they don't use the backlight to project an image.

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Figure 1: Diagram showing the incorrect way to sit during DSE use; adopted from a guide to computing by (CHRISTOPHER BARNATT, 2012)

Health problems associated with the use of DSE.

The Somerset County health and safety institute (2005) classified the health problems of DSE users into; Postural problems, eye problems stress and tiredness. Stepping stones for Business (2007) stated that the health problems of DSE users include; back or neck pain, eyestrain and headaches. The London School Health and Safety Manual (2014) also classified DSE health problems as; musculoskeletal disorders, visual problems and stress and fatigue.

According to Christopher (2012), there is also computer induced skin problems but only very few people experience skin complaints associated with longer-term DSE use. Such skin complaints from itching, rashes on the neck, face or hands, and dry skin. Although there have been controversies regarding this, potential skin complaints may be a result of electrostatic discharges (generated within laser printers and cathode ray tube (CRT) display screens), or proper ventilation is of course always a good idea and may lessen the problem. Also use

has been affecting their skin during an extended vacation or change of job in totally different working environment. Occupational Health Department (2012) has ascertained that few DSE user have experienced irritation skin rashes or aggravated existing skin disorders while working with DSE and the causes seem to be a combination of electrostatic charges, low relative humidity and individual susceptibility. These effects can usually be combated by introducing sources of humidity into the environment.

From the above it can be simply deduced that the health problem of DSE users are;

1. Musculoskeletal problems; which include postural problems, headache, back and entire body ache; neck pain etc.
2. Computer vision syndrome; Eye stain, visual problems etc.
3. Psychological problems; stress, carpal tunnel syndrome, fatigue, tiredness, etc.

Musculoskeletal Disorders

Musculoskeletal disorders (MSDs) are, impairments affecting somebody structures such as muscles, joints, tendons, ligaments, nerves, bones and local circulatory system. They are pathologies of multifactorial aetiology caused and aggravated by the work organisation and performance together with environmental conditions. MSDs are manifested by: discomfort, pain, stiffness, persistent muscle fatigue, muscle cramps,

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tingling and heaviness in extremities. In severe cases, there is a decrease of functional capacity to incapacity at the level of the affected area. Some MSDs are specific because of well-defined signs and symptoms (e.g. carpal runnel syndrome, frozen shoulder). The others are non-specific where there is pain or discomfort, without specific symptoms. This does not mean that these symptoms have to be ignored. Musculoskeletal disorder can be an episodic disease because the pain often disappears and reappears after a few months or years. Some musculoskeletal disorder may become persistent or irreversible. The most affected areas are: back (lumbar area), neck, shoulders, arms, hands and wrists, given the repetitive, static and intensive nature of the DSE work. All epidemiological surveys on DSE users report postural problems more frequent than in employees performing traditional office work. The main types of MSDs that may be encountered among DSE users include: tendonitis, tenosynovitis bursitis, epicondylitis, channel syndrome of upper limbs, (veronica, Aurelia-Mihaela & Lordache 2016)

Some characteristics of task content can contribute to development of hand and wrist MSDs such as: Monotonous tasks versus more varied tasks can cause neck pain; high level of concentration can cause muscle tension in hands and wrists; data entry tasks, similar to repetitive activities, versus dialogue tasks are more likely to cause psychosomatic disorder; a high cognitive load, an increasing mental stain, may contribute to muscle tension at shoulder.

1. Lack of freedom to make decision and control over work task, professional development opportunity: lifelong learning, develop skills, perform a variety of task and that require creativity, role ambiguity - lack of clarity in work responsibilities and duties, work objectives not well define, Lack of social support provided by co-workers and supervisors, support that can make work life easier, role conflict measure of conflicting demand addressed to worker. (Veronica et. Al 2016).

There have been a lot of complaints regarding musculoskeletal problems in the neck and upper extremity in relation to DSE use and they are common in modern society and both show an increasing trend. Previously, review have indicated a possible causal relationship between DSE work and musculoskeletal complaints in the neck and arm. The epidemiological studies of upper extremity musculoskeletal symptoms. (Morten, Therese & Veiersted, 2010).

Musculoskeletal pain and visual discomfort are the main health problems reported by computer workers and the major contributors to workdays lost. Prevalence of musculoskeletal disorders among keyboards users has been reported to be as high as 81% Similarly 86% female and 68% male call centre staff reported musculoskeletal pain with neck and shoulder regions most frequently affected. (Woods, 2005).

A study which was done by computer professional in NCR Delhi shows that musculoskeletal problems affects professional who work with DSE on daily basis and the study revealed that three third of the respondent had musculoskeletal disorders. (Talwar, et. Al. 2009). Musculoskeletal disorders is a major issue, associated with use of DSe. It has also led to other health problems and as the number of world DSE users increase in its million globally, the number of individuals who will be affected by these conditions over time is most likely to double (Kesavachandran et. Al 2006).

A study conducted by centre for musculoskeletal research, department of occupational and public health science university of Gavle, Sweden on professional employees who worked with DSE for more than an hour per day especially men and women aged between 18 to 64 years showed that most workers had symptoms of symptoms of musculoskeletal problems including other eye syndromes and bone and muscle issues professionals showed that the proportion workers with musculoskeletal disorders was found to be 63% and respectively and it was found that the problems were mu lesser among DSE users

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who used anti-glare screen and soft keypads (Shrivasa & bobhate, 2012).

Computer vision syndrome

Computer vision syndrome also known as digital eye stain has been defined by the (American optometry association 2014) as a group of eye related problems that result from prolonged DSE use over a long period of time. The most common symptoms include; eye strain, headaches, blurred vision,, dry eyes and neck and shoulder pain. This symptoms may be caused by poor lighting, glare on a digital screen, improper viewing distances, poor seating posture, uncorrected vision problems and a combination of these and other factors (AOA 2014).

The risk factors associated with computer vision syndrome range from individual vision problems and poor ergonomics. The common symptoms include eye stain, headache, double vision, dry eyes, and other symptoms of eye stain (Akinbinu & Mashalla). As defined by occupational safety and health administration of the us government (OSHA), CVS is a complex of vision and eye problems that are experienced during and related to the use of DSE it is a repetitive eye strain disorder that appears to be growing rapidly with some studies estimating that 90% of the 70 million us workers using DSE for more than the hours per day experience CVS in some from (Bali, Jatinder & Thakur 2007).

Working at a computer is more visually demanding than doing other standard office work. Aspects of the design of the DSE video such as screen resolution and contrast. Image refresh rates and flicker, screen glare as well as working distances and angles may all add up to complicate the eye strain of the DSE user (Sheedy 1994, Campbell 1983), According to (Verma 2001) vision related problems are the most frequently reported health issues resulting from the use of DSE. It occurs in over 70 percent of DSE users worldwide. The complex of eye and vision problems related to near work experienced during DSE use is now being called 'computer vision syndrome.

Apart from CVS being a highly prevalent condition, it is also frequently associated with dry eye disorders. It also contributes to reduction in the rate of blinking of the eyes during DSE use (Portello, Rosenfield & Chu 2013). The human eye prefers to look at objects greater than 6 metres away and as such is forced to move very close to the DSE screen which strains the eyes muscles and leading to eye fatigue (Talwar, Karpoor, Puri, Bansal &Singh 2009). According to (Akinbinu & Mashalla 2014) the signs and symptoms of CVS include; head ache, blurred vision, eye strain, redness of eye, double vision, watery eyes, tired eyes and burning sensation in the eyes.

According to Woods (2005) visual discomfort is a major problem among DSE user which is a major concern and has caused a loss in work and delay in output. A study which was done by computer professionals in NCR Delhi shows that eye strain problems affects professional who work with DSE on daily basis and the study revealed that three third of the respondents had visions problems. The magnitude of visual problems was found to be directly related to average DSE hours per day working for longer hour. (Talwar, er. Al. 2009). A study that was done in 2011 among software professionals showed that the proportion of people with visual problems was found to be 63% respectively and it was found that the problems were much lesser among DSE user who used anti-glare screen (Shrivasa et. Al 2012).

Psychological health Problems

Eric et. Al (2003), carpal tunnel syndrome is a stress-related injury caused by repetitive movement of joints, especially the wrist, and can lead to numerous musculoskeletal problems due to poorly placed computer components and extensive typing over a long period of time. The signs and symptoms of carpal tunnel syndrome include; Pain, Numbness and tingling in the thumb, index finger, middle finger, and the thumb side of the right fingers. These symptoms usually start gradually and during the night while pain may extent up to the arm. Weak grip

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strength may occur and after a long period of time the muscles at the base often thumb may waste away.

According to Steinbach (1999). CTS can be associated with any situation that causes pressure on the median nerve at the wrist such as trauma. The international debate regarding the relationship between CTS and repetitive motion in the work place is currently ongoing and the occupational safety and health administration OSHA has adopted rules and regulation regarding cumulative trauma disorders. Occupational risk factors of repetitive task, force, posture and vibration have been looked into. (Derebery, 2006)

The national institute of occupational safety and health NIOSH indicated that jobs which involve highly repetitive manual acts like DSE operation or specific wrist postures where associated with incidents of CTS and this can cause severe damage to tissues. (Cole et. Al 2006). (According to Veronica et. Al 2016) Psychosocial factors are also a huge health problem among DSE users, mainly through the state of stress, which causes an increase in the muscle tone. When DSE users are stressed, their muscles are more contracted than normal and will not relax completely at rest. Stress increases pain, and make operators more susceptible to other risk factors. They also stated that a number of different psychosocial factors considered as risk factors for musculoskeletal disorder: Highly demanding task overload required to carry out the work: too much work, conflicting demands, too little time to do work (time pressure, increased volume), short time frame etc.

The stress factor, associated with the use of DSE is causing psychosocial and other health problems and the study carried out shows that as the number of world DSE users increase in its million worldwide the number people who will be affected by these conditions in the next three years starting from march 2004 is most likely to double (Kesavachandran, Vastogi, Das & Kan 2006). In 2011 a study was carried out among software professionals, the outcome showed that the proportion of them who suffered stress was found to e 44% and it was found that the problems were much lesser among DSE users who used anti-glare screen and soft keypads (Shrivasa & Bobhate 2012). Anxiety, depression and distress were more frequent among those working more than five hours over their contracted hours per week, and distress for those working more than an hour without a break. It is significant that the majority of workers, up to 82 percent for some symptoms, did not take time off work. Questionnaire responses indicated that many workers had not received the information and training required by the DSE regulations, years after they came into force, and so the full benefits of the legislation were not being achieved. Many DSE workers complain about suffering from very high levels of stress, and mental as well as physical fatigue, when they are involved in work on DSe. Persistent stress may result in psychological health problems, and is also associated with serious physical health problems such as muscular tension, back problems, high blood pressure, stomach disorders and coronary heart disease. (TUC, 2013).

Display screen equipment health problems preventive measures

In 2002, the first DSE equipment policy was postulated which provides a legal framework to protect people against health risks in the use DSE. And that the way to ensure proper compliance with the regulation is the use of the DSE work station checklist.(university of the west of Scotland UWS, 2016). According to Scottish centre for healthy working lives (2016.) The health and safety DSE regulation of 1992 require employers to assess and analyse the work station. It also states that work station must meet a set standard and to make sure that its use does not pose any threat to the life and wellbeing of the operator. Daily work routine must be taken account of so that enough break can be put in to allow the operator move away from the screen for a little while before resuming back to screen, not total break from work but a few minutes or hours to ease off a little stress or tension. Trainings should also be

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provided to ensure adequate use of the DSE. It also says that eye test should be done free of charge for the employees.(According to NEBOSH Health and safety 2016). The health and safety display screen equipment regulation 1992 was amended in 2002 and it applies to all display screen equipment devices. It has the following provisions:Risk assessment must be done be all employers on all DSE work station used but their Employees to be able to curtail a potential risk.Employers should make sure that all employers are provided with adequate from their screens which is stated in the compact law risk assessment form which recommends that at least a five Minute break to do an alternative work away from their desk for at least every 30 minutes.Employees must be aware of their entitlements to annual eye test which must be founded at least by the employer and done by a complete optician and written records must be kept of all who participate or the optician can help do the documentation of all beneficiaries.Proper health and safety training must be made available for all work stations which will basically include how to adjust furniture and the most correct and comfortable way to sit while using the work station.

According to Frederick (2014) from the British journal of occupational therapy, the management of health and safety requires employers to undertake risks assessment, hazard identification in the work place and its associated risks. Elimination or reduction of risks to employees through adequate control measure induction, some of which include; manual handling operations 1992 and health and safety display screen equipment regulation 1992 and these laws have impact on the health and safety of employers. According to the European agency for safety and health requirements for work 2016,employer are mandated by the may 29th 1990 directive on the maximum safety and health requirements for work with display screen equipment (fifty individual directive within the meaning of the article in 16 (1 of directive 89/391/EEC) to carry out analysis of work stations in order to evaluate the safety and health conditions provided for their workers particularly regarding possible risk to eye physical and mental problems resulting from the use of DSE.

Lots of regulations were made as early as 1974 known as the six pack regulation which includes health and safety display screen equipment regulations 1992 which says that any employer who disobeys and refuses to follow the regulations will be fined the sum of 20,000 pounds or will be sentenced to an unlimited fine and the punishment could either go to individuals or to the entire organisation and it will be published by the sentencing guideline council, In Nigeria, there's no indication or document showing any law or anywhere were the DSE act or regulation was adopted as at the time this work was done but a training guideline has been produced for Nigerians who are interested based on the 1992 DSE regulation by the Atlantic solutions, a Nigerian based health and safety consulting firm to help Nigerians have a belter working condition during work with DSE. (Atlantic Solutions Nigeria 2016).

The Council Directive 90/270/EEC defines the minimum health and safety requirements for work with display screen equipment. These minimum requirements are designed to encourage improvements, especially in work environment, to ensure a better level of protection of safety and health for DSE workers. The directive obliges employers to perform a risk analysis of workstations, especially related to eyesight, physical problems and problems of mental stress and to take appropriate measures. All workers need to receive information and training related to their workstation and on the health and safety measures (EU-OSHA 2015) The stress factor, associated with the use of DSE is causing several psychosocial and other health problems and the study carried out shows that as the number of world DSE users increase in its million worldwide the number people who will be affected by these conditions in the next three years starting from march 2004 is most likely to double (Kesavachandran, et al.. 2006).

With the variety and intensity of DSI usage in the modern world and workplace, DSE health and safety is a very significant issue. DSE users and employers need to be sensible to make sure that DSE use is sustainably comfortable and done under as close to optimal conditions as possible. However, there are significant legal implications for employers who do not adequately comply with the law. Apart from the employer, taking all reasonable measures to avoid DSE related disorders is also very importance to individuals regardless or not they ate classified in the workplace as DSE users. Relatively few people alive today have had more than twenty years' experience of working with computers, and nobody has spent an average full working or domestic life interacting with digital technology to the extent that many people now do every day. The long-term implications of computer usage on our health and welfare - physically, mentally and even socially - cannot therefore yet be fully appreciated. Regardless of any regulation, careful, limited and regularly-interrupted computer use is therefore probably the best advice and practice for us all. (Christopher 2012)

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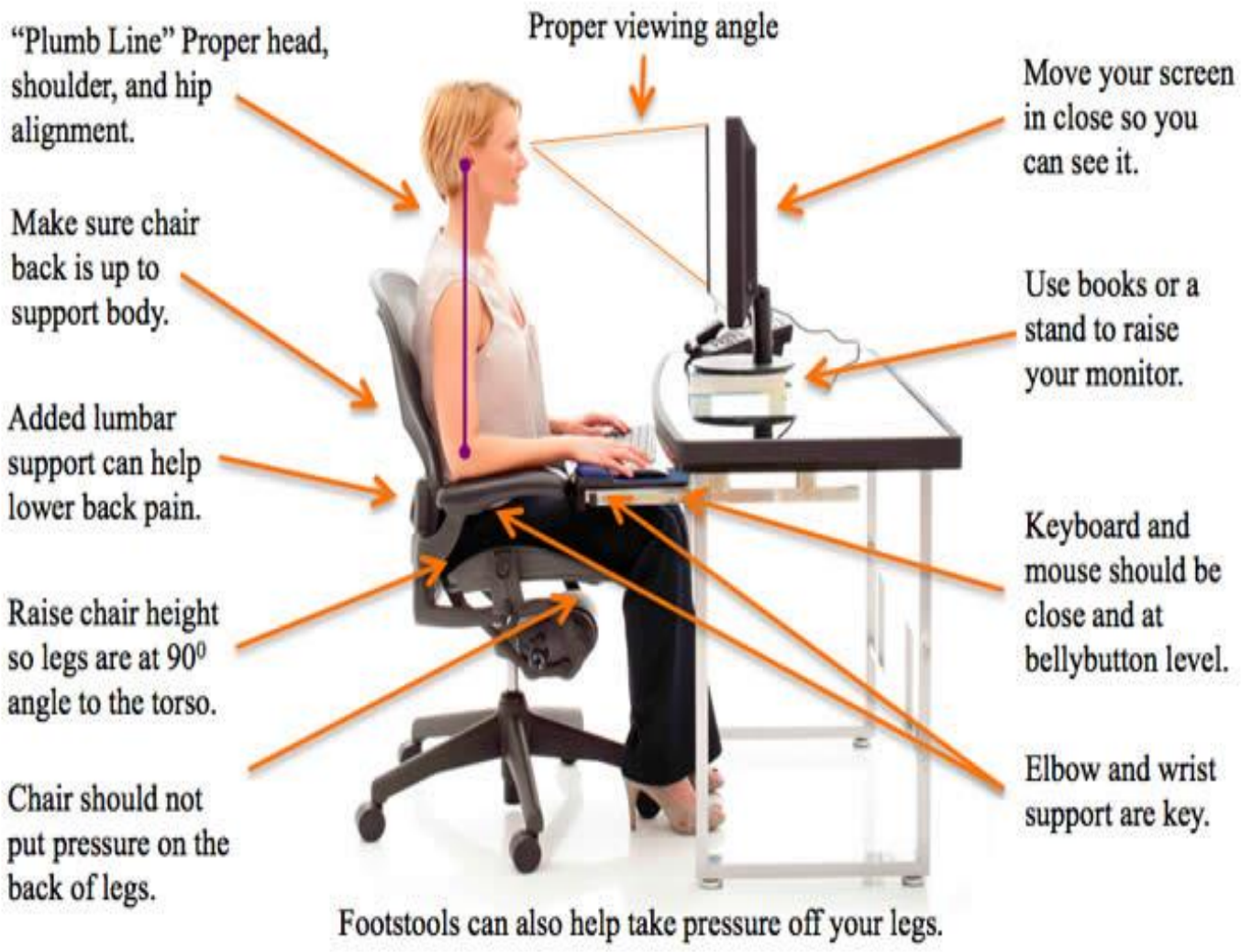

Figure 2: Diagram showing the correct way to sit during DSE use to prevent health problems; adopted from a guide to computing by (CHRISTOPHER BARNATT, 2012)

Conclusion

The various paper reviewed in this paper revealed many health problems associated with working with display screen equipment. These health problems include neck pain, redness of the eyes, excessive watery eyes, headache, numbness of feet and hands, pain in the elbow, shoulder and back, excessive tiredness, tingling movements that increase in the night, stomach disturbance, sleeplessness, indigestion, excessive weight gain, blurred vision, pains

around eyes and burning sensation inside the eyes. These health problems can be reduced or prevented by proper siting position, maintenance of recommended monitor-eye distance, taking break every 30 minutes, running shift, proper hand placement among others.

Suggestions

Based on the observed health problems of DSE, the following suggestions were made:

1. Employers should make sure that all employers are provided with adequate break from their screen which is stated in the compact law risk assessment form which recommends that at least every 30 minutes.
2. Risk assessment must be done by all employers on all DSE work station used by their employers to be able curtail a potential risk.
3. Employees must be aware of their entitlements to annual eye test which be funded by the employer and done by a competent optician and written records must be kept of all who participate or the optician can help to do the documentation of all beneficiaries.
4. Proper health and safety training must be made available for all work stations which will basically include how to adjust furniture and the most correct and comfortable way to sit while using the work station.
5. Employers should make available to their employees, ergonomic DSE work stations to help reduce the negative effect of work on them.

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