

PREVALENCE OF NECK AND SHOULDER PAIN COMPLAINT AMONG COMPUTER USERS IN UWANI, ENUGU SOUTH, ENUGU STATE NIGERIA

¹**Nweke chinonso Vincent**

Princely physiotherapy clinic, porthacourt, Rivers State, Nigeria.

²**Anelechi Kenneth Madume**

Department of Physiotherapy
Faculty of Basic Medical Sciences, College of Medical Sciences, Rivers State University, PH

³**John Nwolim Paul**

Dept of Human Anatomy
Faculty of Basic Medical Sciences, College of Medical Sciences, Rivers State University, Port Harcourt, Nigeria

⁴**Hebinuchi Amadi**

Dept of Human Anatomy
Faculty of Basic Medical Sciences, College of Medical Sciences, Rivers State University, Port Harcourt, Nigeria

⁵**Henry Achulor Amadi-Ikpa**

Dept of Human Anatomy
Faculty of Basic Medical Sciences, College of Medical Sciences, Rivers State University, Port Harcourt, Nigeria

Abstract- The increase in the complaint and discomfort in different parts of the body of computer users is linked with the increase in computer use.

The objective of the study is to investigate the prevalence of neck and shoulder pain complaint among computer users in Uwani, Enugu south, Enugu state.

Ninety four questionnaires were shared to ninety four persons, eighty six were returned (response rate). The mean weight, height and BMI was 64.28 ± 1.24 , 1.54 ± 1.32 , 27.05 ± 8.3 respectively.

A cross sectional survey study design was employed in the distribution of the twenty nine item questionnaire which collected information on the Biodata, educational statuses, use of computer, experience of neck/shoulder complaint, year and duration and level of computer training.

The collected data was analyzed using statistics of mean, standard deviation, and percentages. Result was also illustrated using bar diagram.

The result reviewed that both neck and shoulder pain are common disorders among computer users. The non-neutral posture was attributed to one of the major risks of neck and shoulder pain such as rotation and adduction of the shoulder. Postural stress caused by poor workstation ergonomics, such as location of screen, keyboard, or mouse have been associated with musculoskeletal pain.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Pain is defined as the physical suffering, feeling of discomfort, caused by injury or illness, or feeling of discomfort in a particular part of the body (IASP, 1994).

Pain is an important and inevitable response of body mechanism which usually indicates that something is wrong for example tissue damage or disc degeneration (Merksy and Bogduck, 1994). The International Association for the Study of Pain (IASP) defines pain as an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage (IASP, 1994).

Majority of neck pain are not reported, only patients with severe and recurring symptoms are sent for consultant opinion (Donald, 2003). Most of the pain are usually referred to outpatient department (OPD), but some also physiotherapy.

The computer has been identified as a device that has a unique potential to improve the quality of health care system as well as the efficiency of the health workers both in the developed and developing countries (Idowu, 2003). Despite the fact that information, communication and technology are being used to improve health care systems, there may be associated health hazards with the use of these devices.

School children and adults commonly use computers and Internet this day. Among computer users, the most common areas of complaints are the neck, shoulder and back (Glenn, 1995). Khaki and Rosemoff (1993), in their studies on 'Ergonomics in Back pain' found that poor awkward postures cause fatigue, strain and eventually pain. Poor posture may result in structural deformation of the body, muscular contractures, pain in the back and legs, decreased lung capacity, poor circulation, intravascular pressure, kinks in the bowel and many irregularities in the body (Stuart, 1995). Stuart (1995) again stated that muscles need stimulation to

grow; they need to experience movement and maintain coordination. Good circulation also provides nutrition to muscles and joints, but they will be deprived of that if people stay in the same position all day. Prolonged sitting leads to a slackening of the abdominal muscles and curvature of the spine which in return is bad for the organs of digestion and breathing (Grand jean, 1981). Unnatural postures and bad seating can speed up the deterioration of the discs. Back pain is the leading cause of sickness and absence from work. Experts predict that one in six of employers will be affected by bad ergonomic in one year alone (Margolis and Kostuik, 1995). Benz (1995) reported that computer-related vision ailments and musculoskeletal affects millions of Computer users every year.

Most occupational illnesses are now attributed to cumulative trauma disorder (CTD) or repetitive strain injuries (RSI). Such conditions are carpal tunnel syndrome, back pain, neck pain, tendonitis and eye fatigue or some other ergonomic causes (Niland, 2003). RSI have become the fastest growing workplace illness in the United States, up to an astonishing 70% over a decade ago (Business week, 1995).

Rob Hogan (2000) reported that concentrating on the screen for long period could reduce the blink rate and allow the tear film on the surface of the eye to dry which can result into dry and sore eyes. A study conducted by the Department of Human Factor Engineering, University of Occupational and Environmental Health, Japan, revealed that visual strain occurred after merely 60 minutes of video terminal work, which further resulted in lower productivity (Chaffin, 1995). Headaches result from several things that occur with computer work like screen glare and poor image quality (Alan, 2000). Half of American's work force (about 75 million people) that uses computers daily suffers from computer vision syndrome (Optometry Today, 2002).

Work-related upper limb disorder is a more general description of the problems suffered by people without implying a particular cause. The computer keyboard and mouse are the prime culprits but other items of everyday use can also do the damage (Stuart, 1995). Intensive use of a mouse or keyboard may give rise to aches and pains in the fingers, hands, wrists, arms or shoulders. Carpal tunnel syndrome is the leading cause of occupational illness in the United States with complained absenteeism and medical expenses costing the industry billions of dollars a year (Russel, 2001).

Since the price of computers has gone down considerably in Nigeria the number of users has greatly increased as many organizations and individuals could afford them. Consequently, complaints of musculoskeletal pain are daily reported in the physical therapy department. The aim of this study therefore was to evaluate the pattern of musculoskeletal pain associated with the use of computer. The prevalence of pain reported by computers users occurs mainly at the neck for example cervical vertebrae. (Benz, 1995). Study has shown that neck pain secondary to low back pain is one of the common areas of complaints of discomfort among computer users (Glenn, 1995). This has been attributed to the assumption of poor posture.

Poor posture is assumed by computer users may result in structural deformity of the body structure due to accommodation, resulting to muscle contracture, pain in the back of the legs, decreased lung capacity, poor circulation, intravascular part, and kinks in the bowel and many irregularities in the body (Stuart, 1995). Bad posture and bad sitting position speeds up the deterioration of the disc (Margollas and Kostuik, 1995). Vision alignment has also been reported among computer users (Ben, 1995).

The prevalence, occurrence and pattern of neck pain in different population are available in literature and all showed that it is fairly common and limiting conditions (Ariens et al, 2002).

1.2 Statement Of Problem

In the anatomical alignment of the neck, it shows that torsion and stretching lead to neck and shoulder pain. Therefore neck and shoulder pain among computer users occur as a result of rapid repetitive movement and prolonged static posture (Yu and Wong, 1961; Peper and Gibney, 1997, Wilkens, 2003). These pains mostly occur at different regions of the neck (Yu and Wong, 1996). It is associated with the following factors:

a) Age, (b) workload, (c) Defect of work place set used (d) Posture (e) Duration of daily computer use. (Seppala, 2001). It has been observed that there has been little or no work done on the menace of neck and shoulder pain compliant among computer users in Nigeria. Therefore this work seeks to find out the prevalence of neck and shoulder pain complaint among computer users in Uwani, Enugu south, Enugu state.

1.3 Research Question

1. What are the sex, age distribution ratio among computer users in Uwani Enugu state, with neck and shoulder pain complaint?
2. What are the occupational of the computer users in relationship the neck and shoulder pain among computer users in Uwani Enugu State?
3. What is the time duration spent per day on computer among computer users in Uwani Enugu State with neck and shoulder pain complaint?
4. What are the kinds of computer used by the computer users with a complaint of neck and shoulder pain complain?
5. What are the levels of pain felt (using Visual Analogue Scale) by computers users in Uwani with neck and shoulder pain complain.
6. What major body areas is affected mostly among computer users in Uwani with a complain of neck and shoulder pain.
7. What are the frequency of computer usage before the onset of neck and shoulder complaint among computer users in Uwani Enugu State.
8. What are the ergonomic of their work state? The ergonomic chairs and table in relationship to the conventional chairs).
9. What are the skill level of the computer users in Uwani Enugu State, with neck and shoulder pain complain.

1.4 Research Objectives

The study involved both general and specific objectives.

1.5 General Objectives

The general objective is to determine the relationship between neck and shoulder pain in relation to computer usage.

1.6 Specific Objectives

- 1 To determine the sex distribution of the respondents with neck and shoulder pain complaint in Uwani Enugu state.
- 2 To determine the occupational status of the respondent among
- 3 To determine the average time spent per day before the onset of neck and shoulder pain.
- 4 To determine the type of computer used by computer users in Uwani, experiencing neck and shoulder pain.
- 5 To determine the level of pain experienced by the computer users using Visual Analogue Scale, VAS.
- 6 To determine the area of the body with the highest incidence of pain among computer users in Uwani, Enugu.
- 7 To determine the time frame and usage duration before the onset of neck and shoulder pain among computer users in Uwani, Enugu State.
- 8 To determine the relationship between using ergonomic chairs and table and those using conventional chairs and table in relation to Neck and shoulder pain complaint among computer users in Uwani Enugu state.
- 9 The check the relationship between skilled and unskilled computer users in relationship to neck and shoulder pain.

1.7 Significance Of Study

- This study, will increase awareness on the menace of neck and shoulder pain discomfort associated with the use of computer among skilled and unskilled users.
- It is hoped that the study would add to the existing knowledge on musculoskeletal disorders associated with computer usage in Nigeria and Uwani, Enugu State in particular.
- It is hoped the study will help to sensitize computer user on the need of the knowledge of ergonomics before setting up a computer business centre.

1.8 Delimitation

The study was delimited to males and females age 20years to 60years.From workplaces, offices, cyber cafés, and Business centers in Uwani Enugu.

Chapter two

LITERATURE REVIEW

2.1 Conceptual Framework

The prevalence of neck and shoulder pain complaint among computer users is increasing every day because of lack of knowledge. The predisposing factors, etiology and links are charted to show connection and interrelationship.

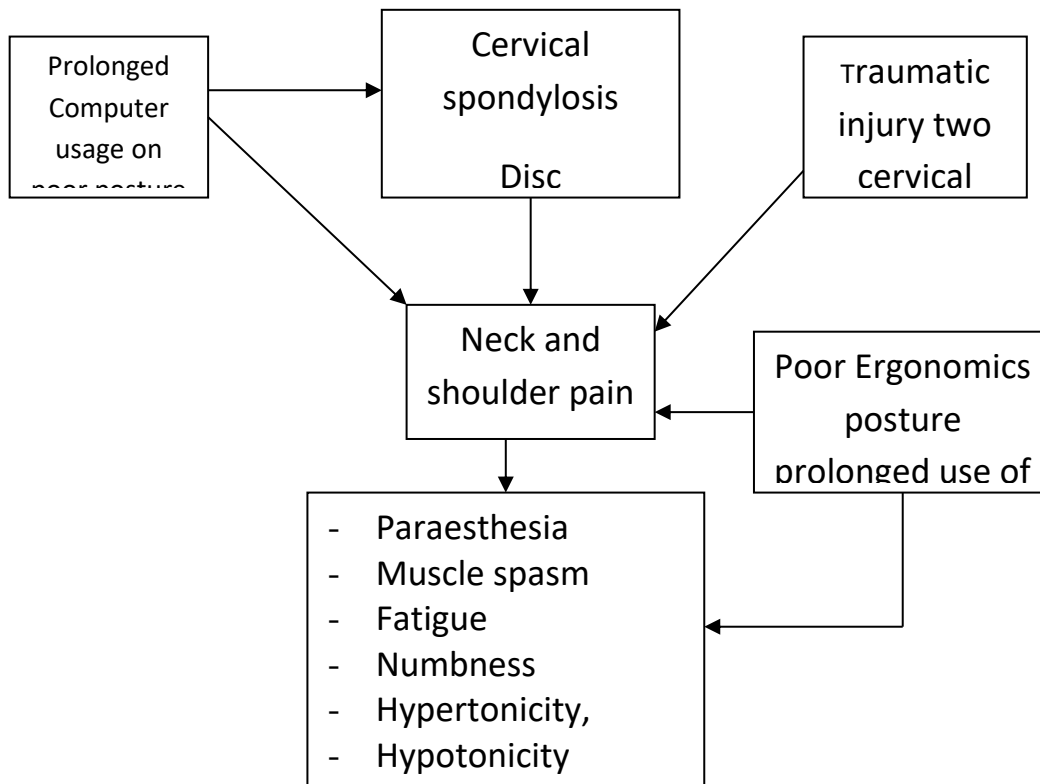


Figure 1.. Diagrammatic illustration of effects of prolonged computer usage on the body.

2.1.2 ANATOMY OF THE NECK REGION

The neck region (cervical spine) is the part of the of the vertebral column that extends from the base of the skull through the neck and trunk (Moore,1992), it connects the head of the trunk thereby carrying the weight of the head. It consist of the seven cervical vertebrae that are the bony building blocks of the spine in the neck (the cervical vertebrae) that surround the spinal cord and canal (Walker 2006). The structures in the neck regions includes; muscles, arteries, veins, lymph gland, thyroid gland, parathyroid glands, esophagus, larynx and trachea (Amy, 2005; walker, 2006). The cervical vertebrae is the most prone to fracture because of its movement they are chain like in form and the cervical vertebrae are connected by resilient intervertebrae disc anterior and Zygapophyseal or facet joints posterior. Also, the atlanto-occipital and atlanto-axial joints are specially designed joints in the neck connecting the head and atlas also atlas and axis form atlanto- axial joint and connecting the atlas and axis respectively (Mckenzie 1990; moore,1992) the atlanto axial joint in the movement of the delicate joint if affected/fractured cause hangman syndrome.

The cervical vertebrae are kept together by ligaments, muscles, intervertebral joints. The bony cervical vertebra serves as a protective passage way for the spinal cord and nerve roots and with the ligaments. It stabilizes the cervical spine and limit excessive movements. The muscles allow for support and motion and the intervertebra disc act as shock absorbers and also aid spinal movement (Moore, 1992).

The neck has high flexibility due to the special design of the atlanto-occipital and atlanto-axial joints and also because no bony structures are attached to the cervical spine unlike the rest of the spine where movement are restricted by the ribcage and pelvis (Mckenzie, 1990).

2.1.3 Neck Pain

Neck pain is an unpleasant sensory experience in the neck which may be manifested as fatigue, tension or pain that radiates to the shoulders, upper extremities or head (Sivola, 2003). This definition, as with the definition of pain by the international association of the study of pain (IASP), points out that pain is subjective with the patient giving the scale depending on the intensity and each individual learns the application of the word and grading through experiences related to injury in early life (Sivola, 2003). The patterns of neck pain are its onset, severity, radiation, duration, quality, aggravating and relieving factors, functional limitation and neurological changes (Brena, 2002).

Chronic neck pain is neck pain of six months or longer duration (Bovem, 1994; Guez , 2002). Chronic neck pain has been reported to afflict 10% - 15% of subjects with neck pain (Hardin, 1995) and is commoner among females than males with ranges of 12.2% to 22% in females and 9.5% to 16% in males (Makela, 1991; Gez, 2002). However, studies have shown that chronic neck pain is associated with a history of previous injury to the neck, back or shoulders, mental and physical stress at work, disability and use of medical services (Makela, 1991; Bovin 1994; Mulhall ,2003

2.1.4 Pathophysiology Of Neck Pain

In the acute phase, neck pain is often nociceptive in origin but when it progresses towards a chronic stage, the influence of psychological and social factors become more marked (Larsen, 2000). Anatomical findings of cervico-colic reflex in the medulla oblongata suggest that neck muscles afferents control posture and activity of the neck (Koskimies, 1997). The nociceptive sensation of pain originates-from the activation of peripheral primary afferent fiber is part of myelinated fiber. A-delta fibers and unmyelinated C-fibers conduct impulses evoked by noxious stimuli through the pain gate theory from the Thalamus and transmit sensation that is considered as Pain (Low and Reed, 1994; Sivola, 2003).

The sensation is carried by the nociceptive fibers to the effector organ through the channel

Affector → Afferent → Integrating Center → Efferent → Effector.

2.1.5 Etiology Of Neck Pain

The pathophysiology of neck pain is better understood while the cause remains unclear and ear understood somewhat unspecific and controversial (Bourghouts, 1998; 2000). The most common causes of neck pain is musculoskeletal abnormalities due to prolonged and sustained activity or posture, Degenerative disc disease and sciatica, osteoarthritis, polymyalgia, rheumatoid arthritis, shingles, strep throat, neck gland inflammation, strain injury and muscle spasm or history of previous neck injury but infections or tumors' may be the cause in rare cases (Mckenzie, 1990; Cash, 2003).

Differentiation between the various causes or chronic neck pain must be based primarily on historical information because there are few objective physical, laboratory or imagery findings that establish definite diagnosis of specific neck disorder (Lilly, 1998; Sivola, 2003).

Cervical pain is mainly a disease of the advanced ages. Earlier studies showed that 65% of people above the age of 65 have had or still suffer from this disease (Sauter, 1991). Structural changes in the cervical disease which take the 'form of progressive degenerative changes are common phenomenon which begin during adolescence and continue throughout life. With advancement in age, the intervertebra disc tends to degenerate causing apposition and ossification. They are probably related to the fact that the disc lack vascular supply (Hirsch, 1991). This result due to excess bending of the neck and back muscle. When doing some computer work, some of the computer operators finds it more convenient to hyperflex the neck during typing instead of using a chair with backrests. With this, the muscle of the back hyperextends leading to increase in length while there will be shortening of the anterior compartment. The pain at the neck will send a radiating or referral pain to the shoulder due to the myotone and dermatone (C₄) (C₂, C₃, C₄). This then boil down to neck and shoulder pain.

2.1.6 Symptoms Of Neck Pain

Work-related upper limb disorder is a more general description of the problem suffered by people without implying a particular cause. The computer keyboard and mouse are the prime culprits but other items of everyday use can also do the damage (Stuart, 1995). Intensive use of a mouse or keyboard may give rise to aches and pains in the fingers, hands, wrist, arm or shoulders and neck.

Headaches result from several things that occur with computer work like screen glare and, poor image quality (Alan, 2000). Half of American's work force (about 75 million people) that use computer daily suffers from computer vision syndrome (Opometry Today, 2002).

Wilkens (2003) listed the common symptoms of neck disorders as follows: pain in the neck, especially in the back of the neck, that gets worse with movement, shoulder pain and muscle spasms, Headache, especially in the back of the head, Difficulty Sleeping, Fatigue, sore throat, stiffness, either intermittent or continuous; deformity especially wry neck; and tingling sensations, numbness or weakness in upper limb. Symptoms in both upper limbs usually indicated a neck disorder, and that no examination of neck disorder is complete without examination of both upper limbs.

Brian (1994) outlined the initial symptoms seen in 45 cases of cervical spondylosis. Their findings are as follows: 45 cases of cervical occurred. In 23 cases, par-aesthesia in limbs was found in 17 cases, while weakness of limbs occurred in 21 cases. The following physical signs were observed, muscular wasting which occurred in several pattern, muscle tone (spastic nature), muscular weakness, and diminished or complete loss of reflexes. Cutaneous sensation in form of appreciation of light touch, pin-prick, deep pain or temperature was found to be impaired in 30 of their 45 cases.

2.1.7 Predisposing Factors To Neck Pain

Many factors results to neck pain thereby it is multifactorial neck pain as a multifactor disease (Ariens, 2002). Disc degeneration is also a major cause, but results during the old age. It may be better understood in terms of web causation where it would develop through complex interaction between many factors which make up interlocking chain (Sivola, 2003). These factors may be biophysical, social or psychological and may promote the inhibition of the symptoms at more than one point in the causal process (Sivola, 2003). Some models of the etiology of neck pain that have been presented are based on neck pain originating mainly from work related physical and psychological and traumatic means (Makela, 1995; Hagen, 1998). Traumatic factor for example Whiplash injury which is a major risk factors of neck pain. It limits Range of motion.

2.1.8 Demographic Variables

Several studies have pointed out that the prevalence of neck pain is higher among females than males and that female gender is at risk factor for neck pain (Makela, 1991; Cote, 2000; Palmer, 2001; Korhonen, 2002). Several studies (Makela, 1991; Boughout, 1997; Plmaer, 2001; Vilkkari-Juntura, 2001; Croft, 2003) reported that the risk of developing neck pain increase with age. The highest incidences of neck pain as reported in some studies were 30 – 40 years (Croft, 2003). 40 – 49 years (Cote, 2000) and 45 – 54 years (vilkkari-juntura, 2001).

2.1.9 Ergonomics Of The Work Station

Study of working condition especially the design of equipment and furniture in order to help people work more efficient. Ergonomic (human factors) is the study of work and working conditions in order to improve people's efficiency (5th edition, Oxford Advanced Learners Dictionary). Similarly, it is also the application of scientific information concerning humans to design of objects, systems, and environment for human use adopted by the international Ergonomic Association (IEA, 2007). Postural stress caused by poor workstation ergonomic, such as inappropriate location of the screen, keyboard, or mouse, have been associated with musculoskeletal problems. By ergonomics intervention, such as supporting the forearm on the tabletop, a reduction of postural load or neck pain has been achieved. Work organizational factors, such as increasing work pressure or hurry and lack of job security or decision making opportunities, as well as problems in work atmosphere may contribute to an increased occurrence of work related neck/shoulder complaints (Ketola, 2003). Quite a number of the furniture at work places do not conform to the ergonomics standards and has been reported to be associated with neck pain (Kroemer and Grandjean, 1997). Ideally the back of the chair should come high enough for the head to rest against it Mckenzie, 1990). The position of the low back strongly influences the postures to the neck. If the low back is slouched without support, it is impossible to sit with the head and neck pulled backwards, resulting in a rounded low back and protruded head and neck, that is, the forward head posture (Mckenzie, 1990). Forward head carriage adds up to 30 pounds of pull on the cervical spine (Wilson, 1995). Increase neck flexion increases the load on the neck muscles. At about 30% flexion, the load is about 15mvc%, muscle fatigue sets in and pain arises (Hagberg, 1987). A positive relation has been reported between neck pain and forward head posture (Mckenzie, 1990; Chui, 2002) and neck flexion (Ariens, 2001).

2.2 Work Hours

A study by Wergeland (2003) examined the relation between daily work hours and the occurrence of neck pain among 591 subjects from three different locations. The intervention was a reduction of daily work hours seven hours and more (or 35 hours and more each week) to six hours (30 hours each week).

Reports pointed out that the incidences of neck pain decreased form 40.9% to 25.6% and 57.1% to 37.1% in 15 years at two locations and 81.6% to 86.2% in one year in the 3rd location. It was therefore reported that shortening regular workdays to 6 hours (or 30 hours each week) might considerable reduce the incidence of neck pain.

The relationship between psychological stress, and workload at work and neck pain in different occupational groups have been well documented (Makela, 1991; Krause, 1997; Engstrom 1999; Miranda, 2001; Sivola, 2003). Some variables investigated include

workload (Engston, 1999; Wergeland, 2003) psychological demands (Sivola, 2003) mental stress at work (Makela, 1991, Miranda, 2001; Palmer, 2001) and associated with neck pain have been found in all.

2.2.0 Skills In The Use Of Computer System

Skills according to Oxford Dictionary is defined as the ability to do something well. Being skilled is having enough ability, experience and knowledge to be able to do something well. Skilled computer users are users who have a strong general knowledge about how computer work and what they can do I.T and Society Project, 2004). They know the main types of applications that are used on computers and they know the features expected to be seen within an application IT and Society Project, 2004). The most striking characteristic of skilled computer users is the presence of some kind of organized problem-solving strategy. Skilled computer users are skilled problem solvers, they rely far more on their ability to solve new problem and find answers independently than on previous knowledge of the commands of an application program (IT and society Project, 2004). They are generally referred as computer wizard in our local language (Jargen) they have the ability to manipulate the computer in order to get a available result.

2.2.1 Association Between Computer Usage And Neck Pain

Musculoskeletal disorders of the neck and shoulder are the common occupational health problem associated with computer usage and account for the majority of work related lost time. Sustained pain in the upper extremity and neck regions and specific musculoskeletal disorders, such as wrist tendonitis, epicondylitis, and trapezius muscle strain Scalene, and sternodeidimast pain/strain are higher among computer users (Rempek, 2006). The most consistency observed risk factors are increasing hours of mouse or keyboard use and sustained awkward postures, such as increasing wrist extension and keyboard above elbow height.

The association of shoulder symptoms with keyboard use is weak, but there is some evidence of increased risk with increasing hours of computer mouse use (Rempel, 2006). Among individual factors, female gender and older age have been found to be associated with a more frequents report of neck pain (Ketola, 2003). More so, prolonged use of computer may often result in computer eyestrain, Headaches and stiff neck. It also affects vision due to constant illumination of light into the eyes. It increases the chances of Glaucoma and can lead to blindness. Eyestrain inevitably develops after lengthy use of the eyes as in sitting in front of a computer, writing, reading or other detailed work. Prolonged use of the eye as well as the stress and tension of day to day living cause a tightening of delicate eye muscles and also the facial muscles around the nose, cheeks and temples. The resultant eyestrain eventually manifest itself in everything from burning eyes and blurred vision, to headaches, migraines and may even trigger cluster headache attacks.

Neck pain symptoms can vary from a dull, annoying ache, to an acute, merciless throbbing pain that ends up expanding to shoulders and lower head and may eventually end up causing dizziness and loss of concentration (Gerr, 2005). This results from the sharing of common dematome. Shoulder has C₄ as dematome, it is start from the neck.

2.2.3 Management Of Neck Pain

The cause of neck pain in most patients remains unknown. Thereby termed idiopathic. No permanent cure has been identified for the disease (Cash, 2003). Appropriate assessment, diagnosis and treatment including patient's education can minimizing symptoms and help patients maintain active and productive lives (Krause, 1997). Stoney (1991) outlined the following forms of treatment for cervical spondylosis: Drugs (oral analgesics), bed rest, immobilization of neck with collar, heat, massage manipulation, intermittent traction, exercises, and muscle strengthening exercises. Other forms of treatment are instructions on head positioning, posture instructions and manipulation.

In traumatic neck injury, for example Whiplash injury, the patient has a blackout for the moment of occurrence before the setting in of rigidity which is spasticity at the neck. It is corrected by the use of IRR (infra Red lamp) to reduce spasticity then massage with effleurage. Thereafter cervical collar is used in order to immobilize the neck. If there is a compression force on the neck, there will be need for traction in order to release the joint appositions.

2.2.4 Review Of Emprical Literature

The implication and understanding from the previously carried out work has shown some loop holes in achieving point and factors that are relevant in the prevention and management of neck and shoulder pain complaint. Like the work of Daramola (2006). He carried out his work without really putting into consideration the root cause of the problem. He shared many questionnaires but was not able to get all. He continued without inquiring about previous episode of back pain before the research was carried out.

The reviewed work has shown that the extent and the level of literacy among computer users in consideration to neck and shoulder pain is still less sufficient.

Daramola (2006) did not consider whether the subject had experience back pain before, whether of known cause or idiopathic in origin.

The work of Cote (2000), only addressed the Pathophysiology of pain without looking into the etiology and history. The work of R.A Adedoyin. B.O. Idowu, R.E Adagunodo (2001) and P.A Idowu (1999) dealt with the musculoskeletal pain associated with the use of computer.

Moreover, the work is aimed at getting all these factors solved and taken care of.

CHAPTER THREE**SUBJECT, MATERIAL AND METHOD****3.1.0 Research Design**

A cross sectional survey design was used for this study

3.1.1 Location Of Study

The study was located at Uwani Enugu South, Enugu State, Nigeria.

3.1.2 Target Population: The population considered here were computer users between the ages of 20years – 60 years of age.

3.1.3 Sampling Technique

Sample of convenience was employed in the study. That is, as many as consented and volunteered to participate at the study at the covered area of study.

3.1.4 Sample Size

Sample size for a finite population was used.

3.1.5 Selection Criteria

The selection criteria is as follows:

3.1.6 Inclusion criteria

Apparently healthy computer males and females.

Computer users within the age of 20 years – 60 years.

Computer users residing in Uwani Enugu south only.

3.1.7 Exclusion criteria

Computer users having any chronic disease for example rheumatoid arthritis.

Computer users with history of traumatic cervical injury.

Computer users with history of degenerative disease for example cervical spondylosis, cervical degenerative disc disease.

Computer users with acute neck injury, infection and inflammation for example thyroid and trachea inflammation.

Computer users with History of Pott's disc.

3.1.8 Subject Description

The subjects were males and females aged between 20years and 60 years old selected from offices, classrooms, cybercafés, and commercial centers known as business centres in Uwani Enugu South, Enugu State Nigeria.

3.1.9 Materials

Opinions and responses of the computer users that who were involved in the study was collected with the use of a researcher developed thirty item questionnaire, made up of four sections as follows:

Section A: Information on the bio-data of the computer users which include age, gender, height, weight and occupation.

Section B: Information on the educational status, level of computer training attained and the level of skills of the computer users.

Section C: Information on the year and duration of computer usage. Effect of exposition to computer usage.

Section D: Information on the use of computer and experience of neck/shoulder pain. Rating of pain using VAS (Visual Analogue Scale).

3.2.0 Procedures

Subjects' approval and informed consent was obtained before the administration of the questionnaires. The respondents were assured of the confidentiality of their response. They were adequately informed on how to complete the questionnaire which was collected immediately after completion. An informed consent form was obtained from the participants and copies of the questionnaire was distributed by the researcher.

3.2.1 Ethical consideration

Ethical approval was obtained from the ethical research committee University of Nigeria Teaching Hospital Ituku Ozalla, Enugu.

3.2.2 Data Analysis

The data collected was analyzed using descriptive statistics of mean, standard deviation and percentages.

CHAPTER FOUR**4.1 Results****Clinical Characteristics Of Respondent**

Table 1. Demographic data of the respondent

	Mean	S.D
Height (m)	1.54	1.14 ± 1.2
Weight (kg)	64.28	36.19± 2.2
BMI (KG/M ²)	27.05	25.46 ± 1.4

Table 1, shows the mean values and the standard deviation of the Height, weight and the Body mass index (BMI). The height has a mean value of 1.54 and S.D of 1.14±1.2, the Weight has a mean value of 64.28 and S.D of 36.19±2.2. the Body mass index has a mean value of 27 and S.D of 25.46±1.2.

Research question 1, What are the sex, age distribution ratio among computer users in Uwani Enugu state, with neck and shoulder pain complaint?

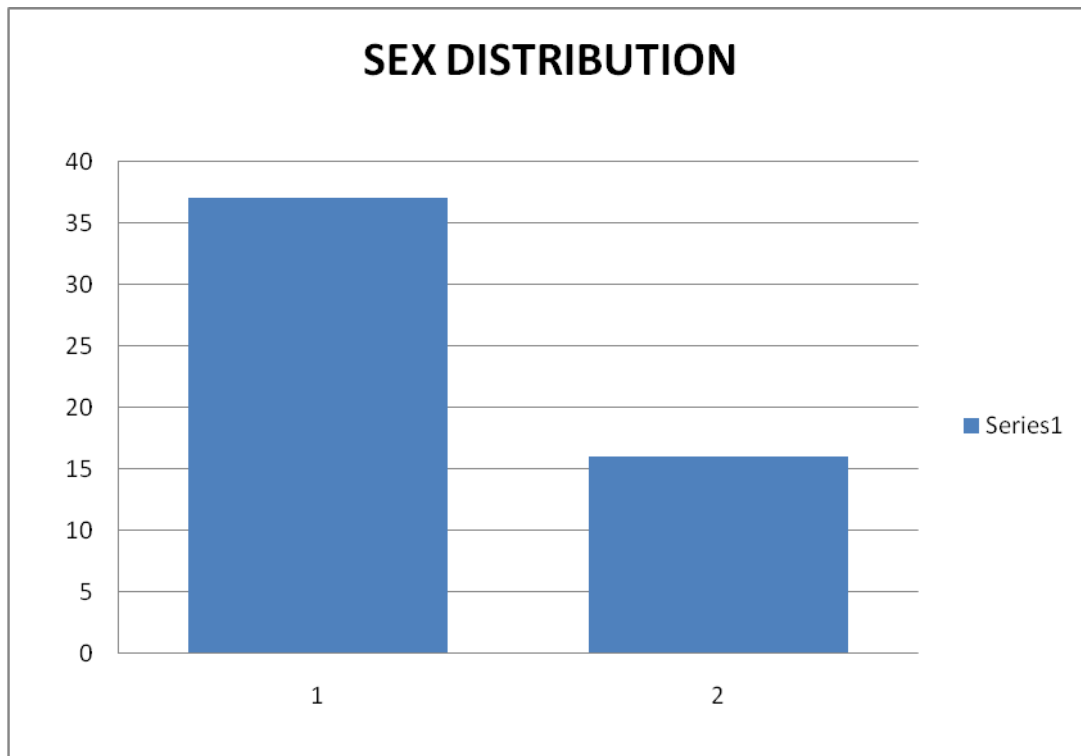


Figure .1. Sex distribution of the respondent

A total of 94 questionnaires were distributed and 92 were recovered. This gave about 91.49% response rate. Fifty eight (67.44%) were males and thirty four (32.56%) were females respondents respectively Figure1.

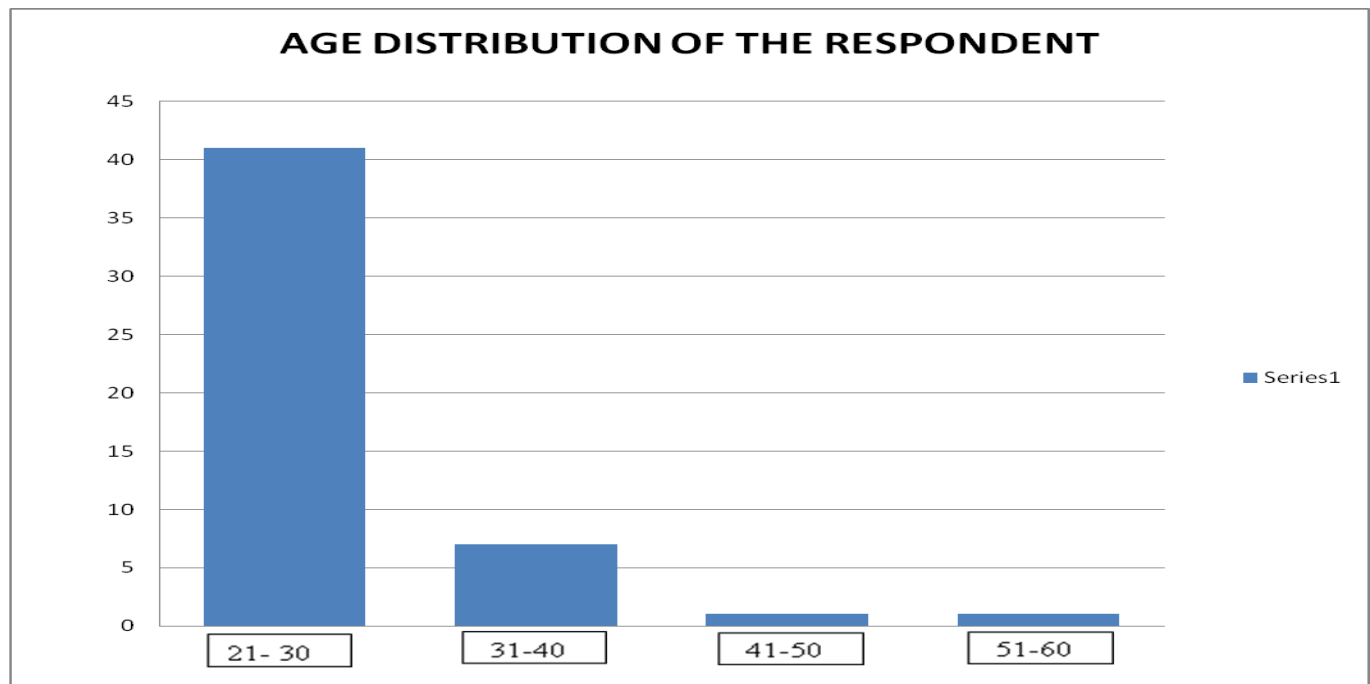


Figure 2. Age distribution of the Respondents

Figure 2, Shows age distribution of the respondents; age range between 21 and 60 years. The mean age of the respondent was 21.2 years. The age range of respondent was 62 (72.09%) between 21-30 years which has the highest occurrence of pain distribution. The range between 31-40 has 19(22.09%) respondent and 41-50 years with 4(4.65%). The age range 51-60 has 2 (1.16%) respondents.

Research question 2, What are the occupational of the computer users in relationship the neck and shoulder pain among computer users in Uwani Enugu State

Occupation	Frequency (n)	Percentages (%)
Computer operator/ business center	47	48.91
Student (internet users)	45	42.33
Bank worker	8	8.76

Table 2: Occupational Distribution of the Respondents

This shows the level of education attainment of the respondents. Forty two percent (42.33%) of the respondents were students. Twenty seven percent (48.91%) are commercial computer operators. Eight percent (8.76%) were bankers.

Research question 3, What is the time duration spent per day on computer among computer users in Uwani Enugu State with neck and shoulder pain complaint?

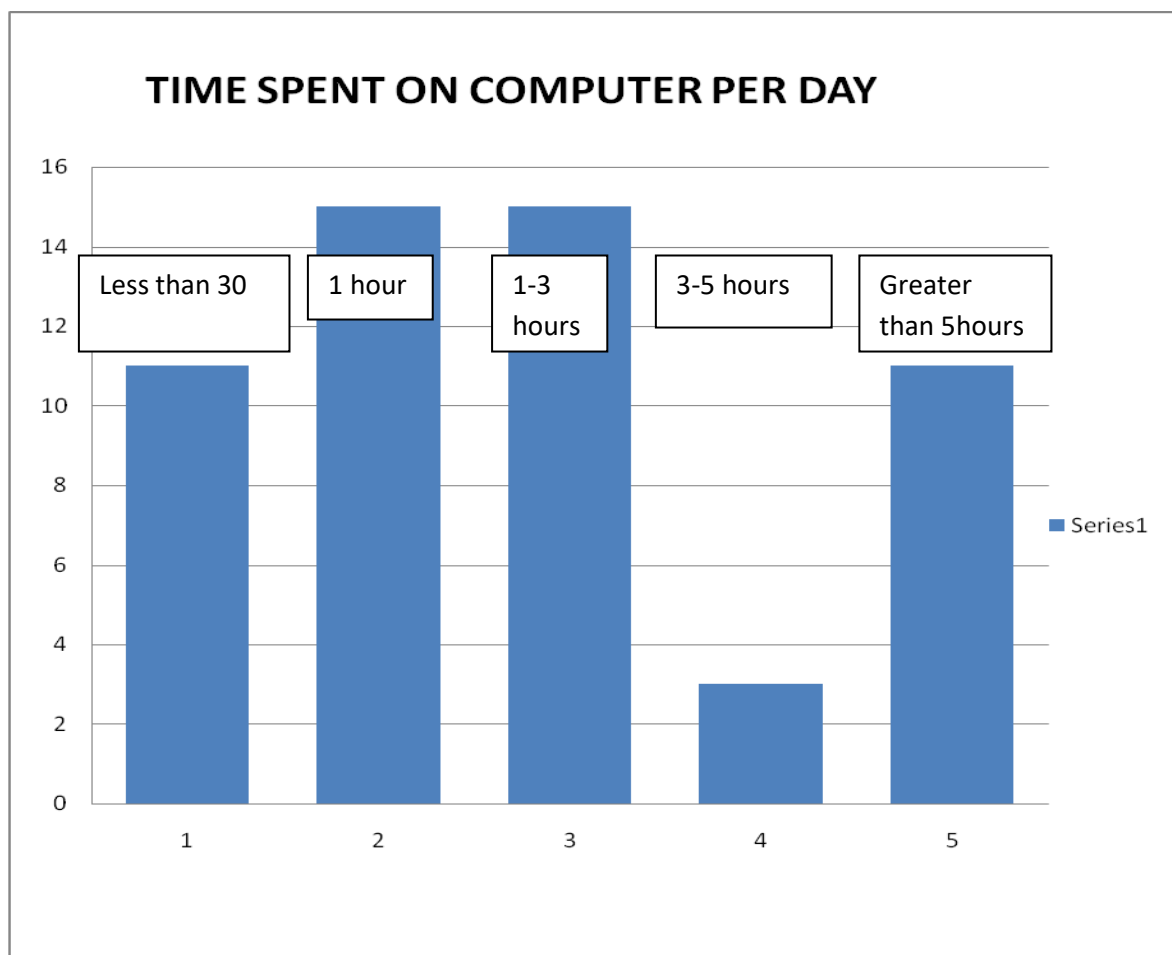


Figure 3: Average time spent working on the computer per day

Figure 3 compared the average time spent on the computer per day, also before break. 30% spent approximately 1-3 hours at a stretch on the computer without a break/per day. 18% spends at least less than 30 minutes and greater than 5 hours on the computer at a stretch without break/per day. While 2% spends approximately 3-5 hours per day.

Research question 4, What are the kinds of computer used by the computer users with a complaint of neck and shoulder pain complain?

Figure 4: kinds of computer used

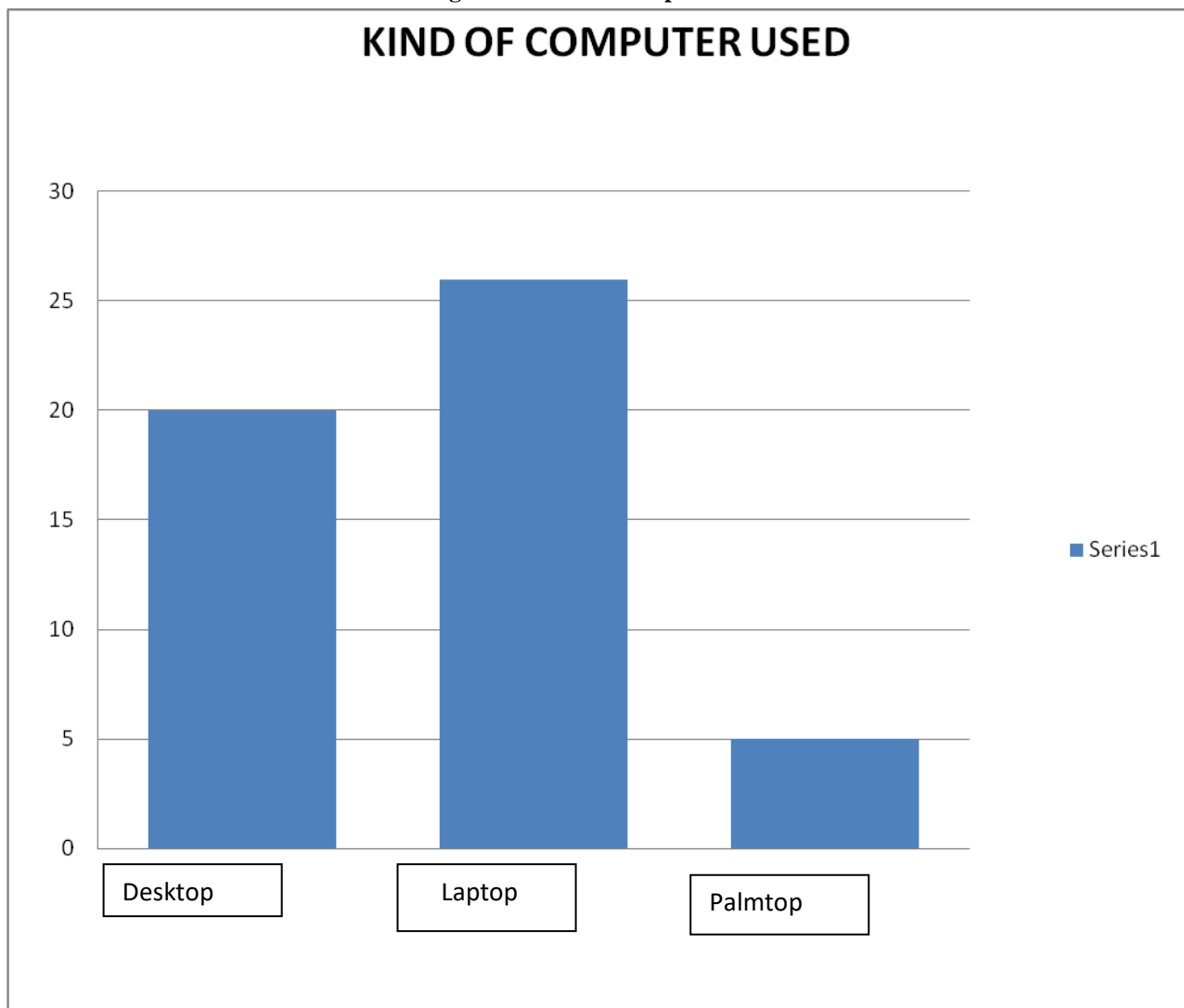


Figure 4 showed the type of computer used by the respondents. 60% makes use of a laptop, 30% makes use of desktop, while 10% uses palmtop.

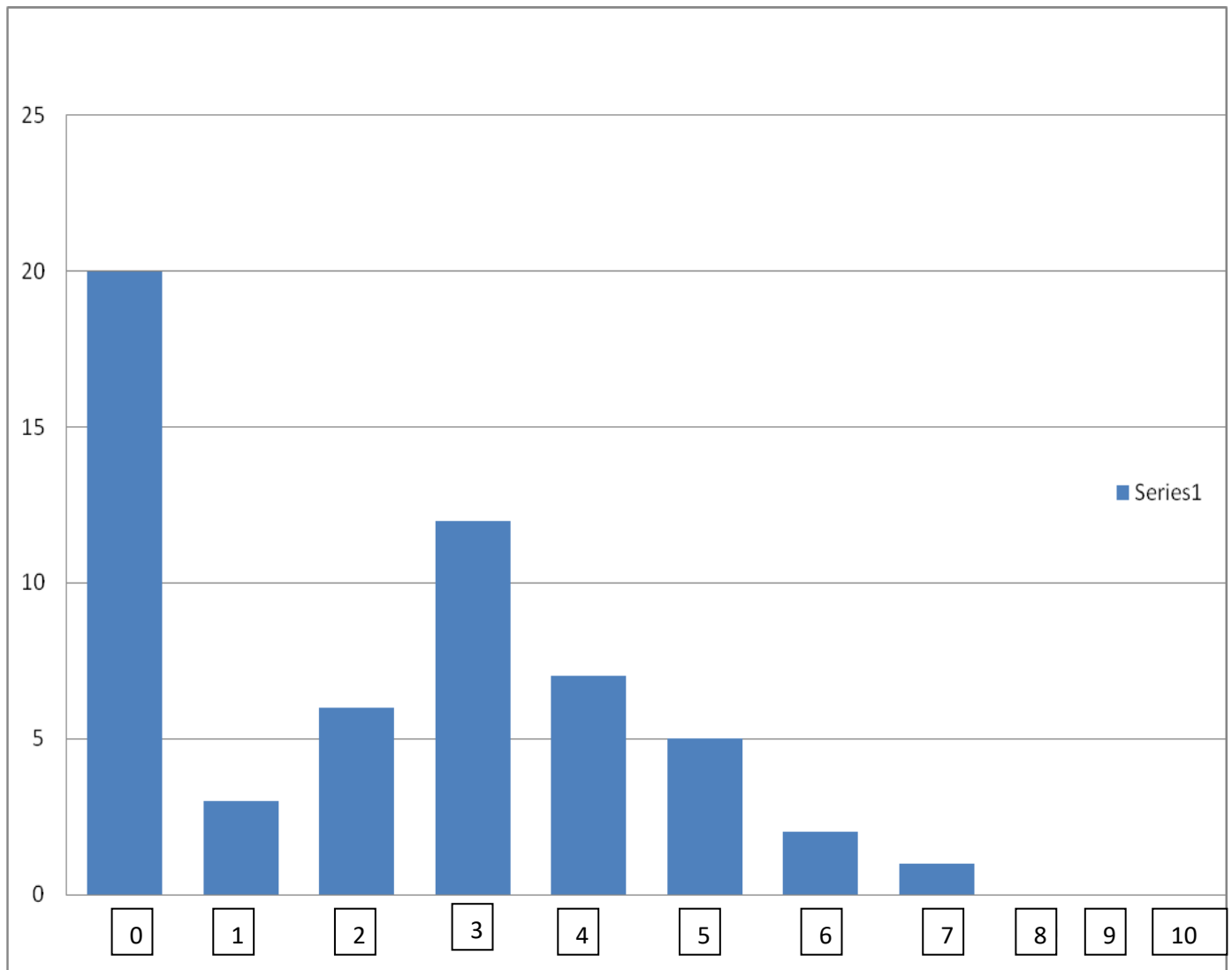
	Frequency (n)	Percentages (%)
Point prevalence		
Yes	18	20.93
No	68	76.07
12 months Prevalence		
Yes	48	66.44
No	16	31.56
More than 12 months prevalence		
Indifference	4	2.1

Table 3: Prevalence of neck / shoulder pain among the respondents

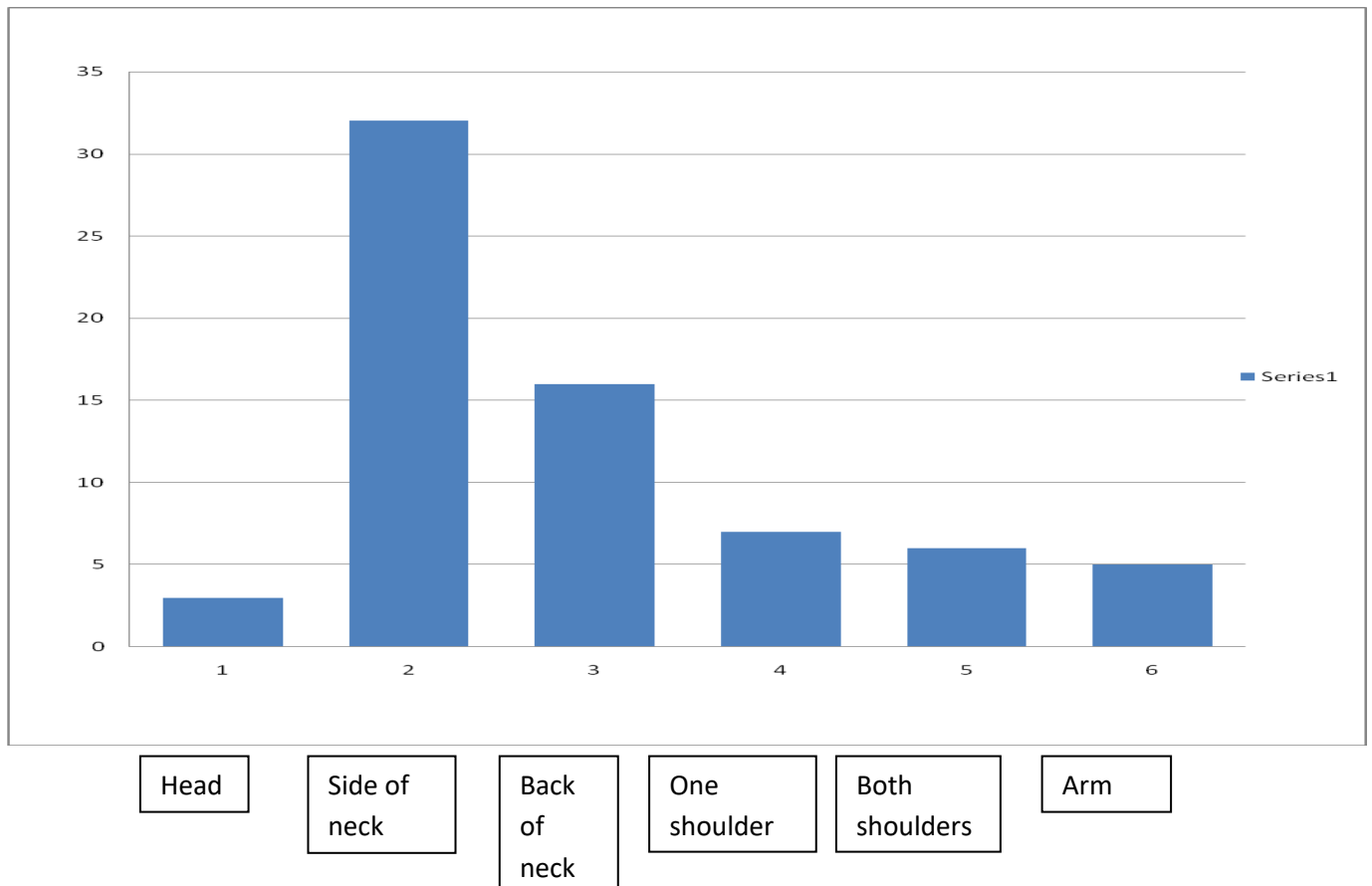
This table 3 shows the starting point of the respondents pain while using the computer. In point prevalence, some responded that they started feeling the pain at the early stage of computer usage, while some responded it came after 12 months usage. 20 percent (20.93%) said the pain came immediately they started using computer (within few weeks). 66.44% said the pain came after 12 months of computer usage, 31.56% said it came beyond 12 months, while 2.1% is indifferent.

Research question 5, What are the levels of pain felt (using Visual Analogue Scale) by computers users in Uwani with neck and shoulder pain complain.

Figure 5: level of pain experienced using VAS



Research question 6, what major body areas is affected mostly among computer users in Uwani with a complain of neck and shoulder pain.

Figure 6: Body part were pain is experienced

The distribution of body parts where pain is experienced by the respondents as shown in figure 7. There are indications that the part of the body where pain is felt most was the neck 32 (46.38%). Back neck 16 (23.19%), one shoulder 7 (10.29%), both shoulders 6 (8.82%), Arm is 5 (7.35%). Then the head is 3 (4.42%) respectively

Research question 7, What are the frequency of computer usage before the onset of neck and shoulder complaint among computer users in Uwani Enugu State.

Figure 7: Frequency of Computer use

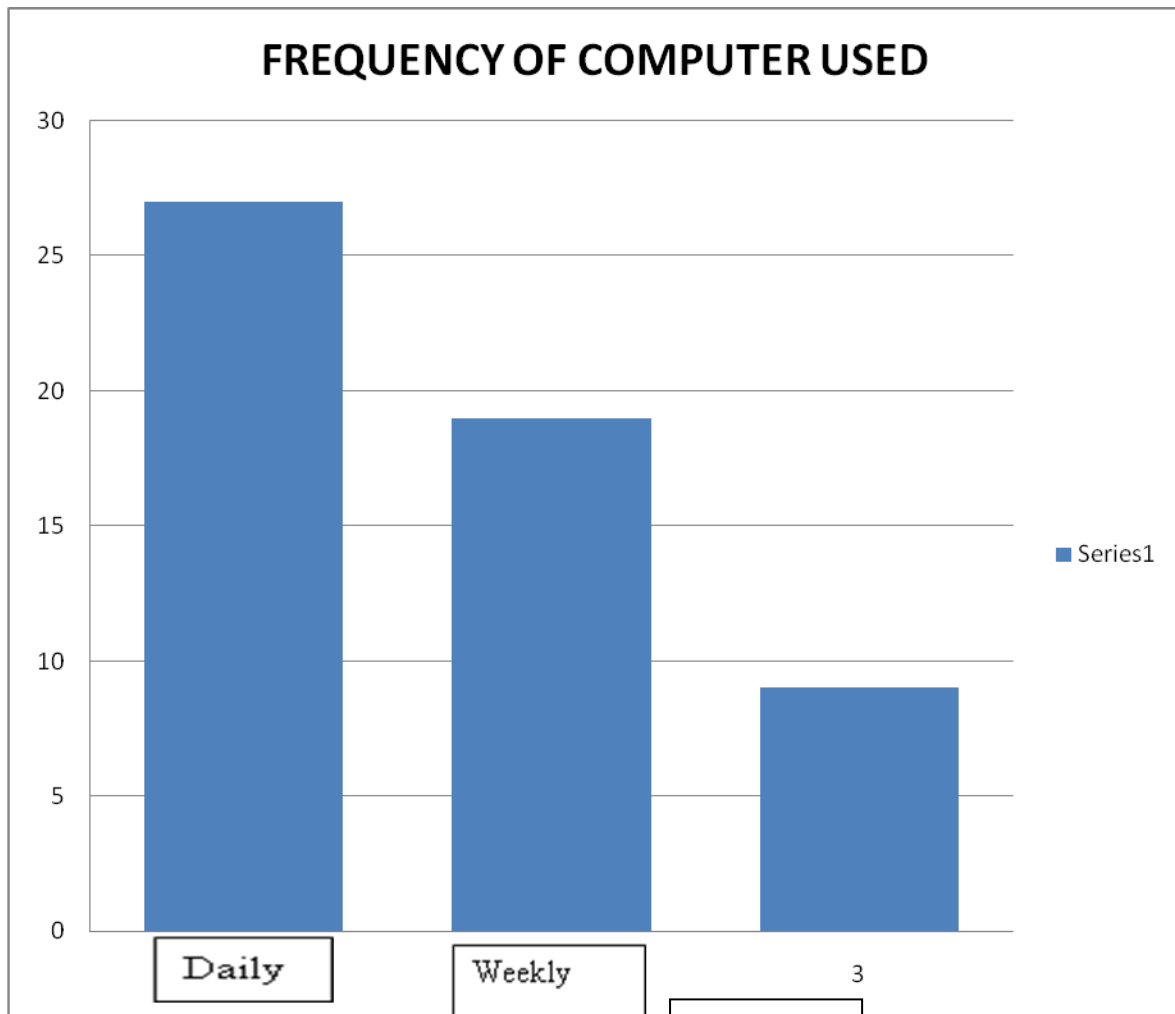


Figure 7 shows the frequency of computer usage among respondents. 30% of the respondents use the computer everyday, 30% of the respondents use the computer on a weekly basis, while 20% access the computer monthly.

Research question 8, What are the ergonomic of their work state? The ergonomic chairs and table in relationship to the conventional chairs).

Table 4: Kinds of furniture used and sitting postures

Characteristics (n)	Frequency (%)	Percentages
Furniture type		
Conventional chair and table	58	67.44
Ergonomically designed computer Chair And table	28	32.56
Respondent who associates neck/ Shoulder pain complaint to sitting posture		
Yes	72	83.72
No	14	16.27

From table 4, it has shown that about 67% of the respondents does not make use of ergonomic chairs and tables, while about 32% uses ergonomically designed chairs and tables.

Research question 9, What are the skill level of the computer users in Uwani Enugu State, with neck and shoulder pain complain.

Figure 8: Level of typing Skill of the respondent

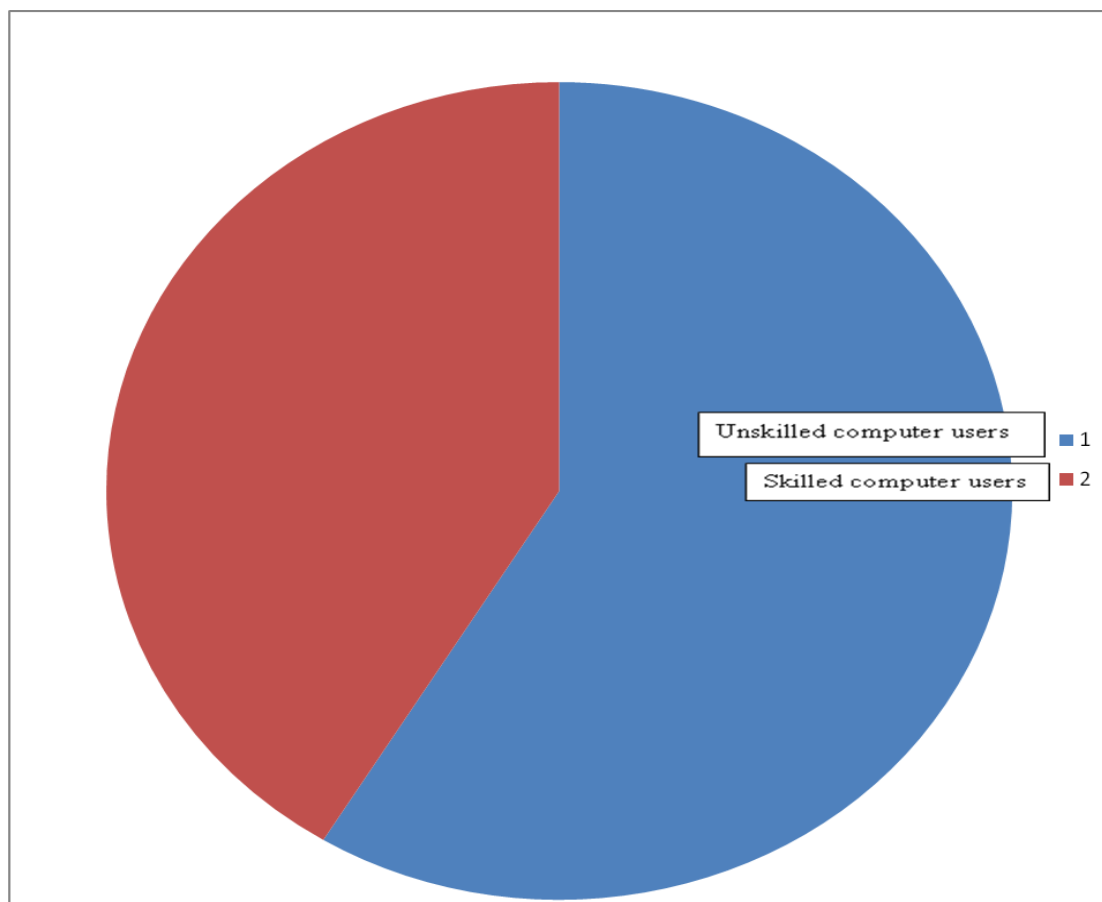


Figure 9, shows the skill level of the respondents. Those that went through training to master how to use computer (skilled) and those that just learnt it on their own (Unskilled). 65% of the respondents are unskilled while 45% have the knowledge of computer usage through formal education/training

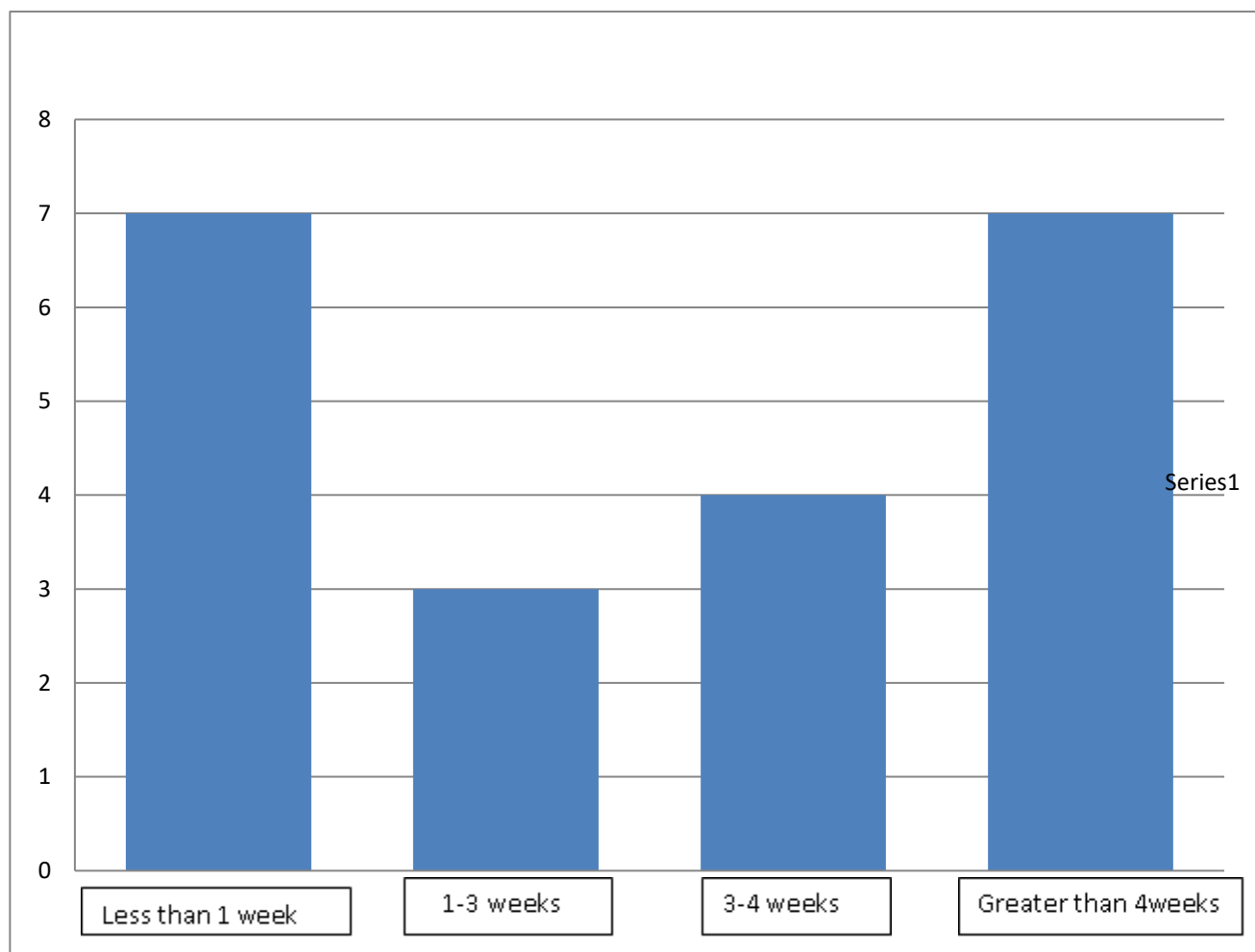


Figure 9: length of neck and shoulder pain experience

Figure 9 shows the duration of the neck and shoulder pain experience among the respondents before this research. 35% agreed to have felt the pain for less than 1 week, 35% said it's been on for more than 4 weeks, 20% said it has lasted for about 3-4 weeks while 10% said it's been on within 1-3 weeks.

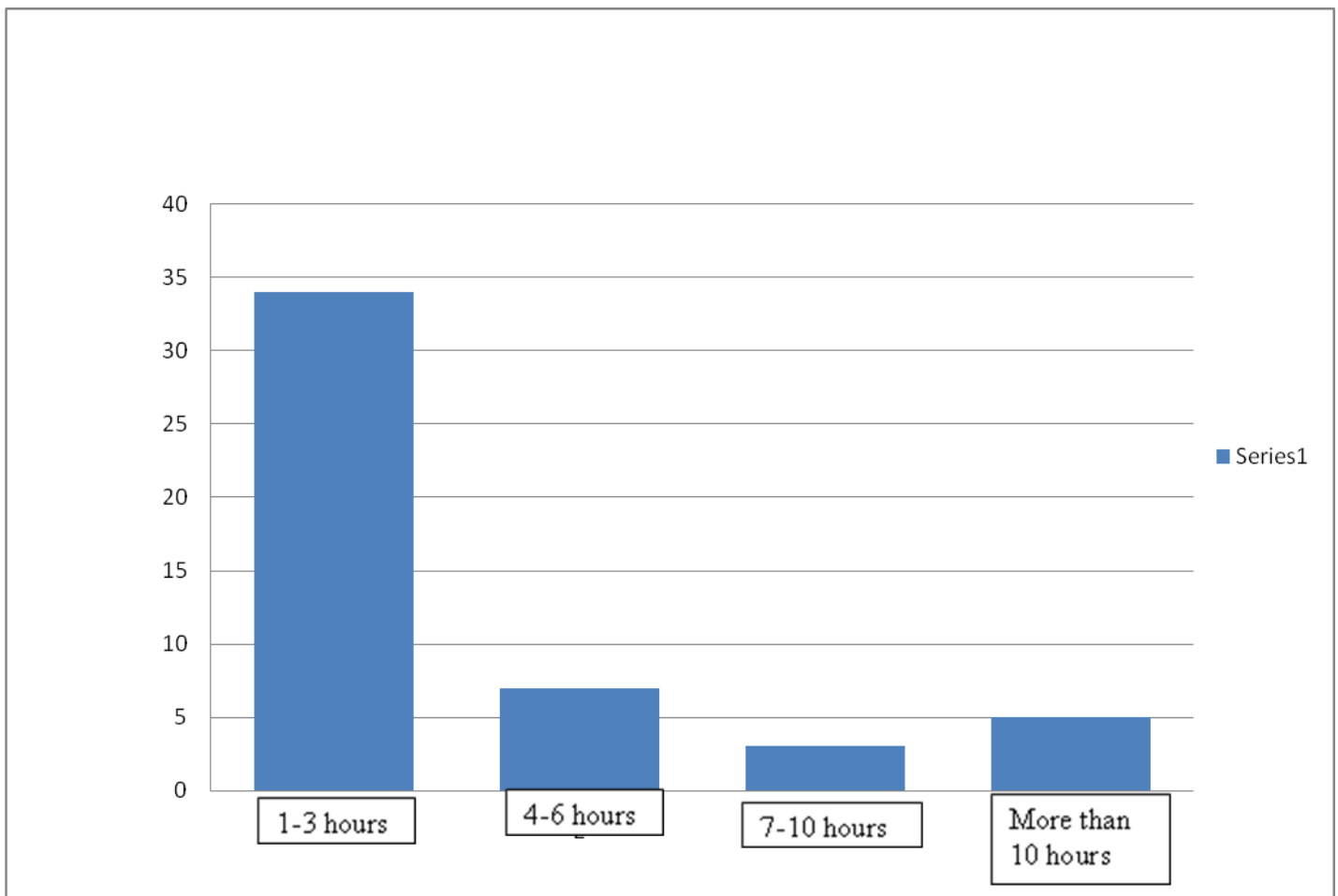


Figure 10. Length of time spent working on the computer at a stretch

Figure 10, buttresses the point on the usage of computer without break. It was shown that 80% uses the computer 1-3hours without break, 10% stretch their own time from 4-6 hours, 4% stretches 7-10 hours while 6% stays more than 10hours at a stretch.

CHAPTER FIVE

Discussion

The aim of the research is to find out the prevalence of neck and shoulder pain complaint among computer users in Uwani Enugu East, Enugu state. The result implied that neck and shoulder pain complaint is on the increase among computer users. This is in agreement with the work of Stuart (1995) who reported that the most common site of pain among computer users is on the neck and shoulder.

The study pointed out that the prevalence of neck and shoulder pain complaint is higher among males than females therefore showing that males are at higher risk for neck and shoulder pain. This is not in agreement with the study of (Makela 1991; Cote 2000) who reported that neck pain is higher in females than in males therefore showing that females are at higher risk of neck and shoulder pain. The highest incident was reported by Croft, (2003) to fall within 21-30 years which is in correspondence with this study. There are also indication that majority of the respondent spent an average of 1 – 3 hours on the computer at a stretch which shows that pain perception at different anatomical region is prompted among the respondent for 1 hour and 1 – 3 hours including 4 – 6 hours on daily basis. This study also showed that in appropriate physical work environment and postural stress caused by poor workstation ergonomics, such as inappropriate location of the screen, keyboard, or mouse have been associated with musculoskeletal disorders. Work organization factors such as increasing work pressure and lack of security and job making opportunities, as well as problems in work atmosphere may contribute to an increase of work related neck and shoulder pain complaint Ketola (2003). Neck pain may arise from wrong placement of monitors Grandjean (1981). Majority of the respondent has no ergonomic instruction at their work place. This might be the reason for the increase rate of neck and shoulder pain complaint in this study. The study also shows that respondent who have formal training and are more skilled spent more time working on the computer. This agrees with Rempel (2006) that observed that prolong use of computer may precipitate musculoskeletal disorders. The following observations were made;

- Work related and individual factors, with their interactions were found to be a contributing factor to neck and shoulder pain complaint among computer users.
- Respondents with a high stress level and sedentary lifestyle are more exposed to the high risk of neck and shoulder pain.

Conclusion

From the result of this study, it showed that neck and shoulder pain complaint is more prevalent among computer users. The most prevalent problems with neck pain are headache, computer eyestrain, shoulder pain, low back pain, elbow pain, hand complaint and wrist pain.

- Majority of the respondent were aged between 20 – 30 years and above with the peak age 30 – 40 years.
- Student (internet users) was more among the respondents. They use computer for internet purposes like browsing, word processing, games, and programming among others.
- The skilled computer users spend more time working on the computer than the unskilled computer users. Pain is more severe on the skilled users within 4 - 5 years working experience on the computer system (Idowu, 2003).
- Majority of the respondents uses conventional chair and table which is quite different from purposely designed computer chair and table. This could possibly lead to neck and shoulder pain.
- Laptop and desktop system was the commonest type of computer used by the respondent. This could have been a predisposing factor to neck and shoulder pain.
- The length of time spent working on the computer per day and prolonged hours of sitting has significant influence on the prevalence of neck and shoulder pain complaint among computer users.
- By ergonomics intervention such as supporting the forearm on the table to, frequency of break at work, a reduction of postural load and back exercises could be achieved.
- In the prevention of neck and shoulder pain among computer users, attention should be given to the physical work environment in general and the specific aspects of the monitor workstation layout.

RECOMMENDATIONS

Based on the findings from the study, the following recommendations were made.

- Computer users should be provided with appropriate ergonomics training, work station design and lightning.
- Computer users should be educated on proper maintenance of sitting posture while working with the computer.
- There is need to focus on research, health planning's and health educations for computer users.
- Seminars should be conducted by physiotherapist in conjunction with occupational therapist to enlighten the computer users about back care guidelines which will help to reduce the possible cause of neck and shoulder pain.
- Computer users should also be encouraged using the purposely built computer chair and table with back rest in order to reduce the risk of neck and shoulder discomfort.
- There is need for computer users to practice interruption of break at intervals and engage in some physical exercises as this will ease the pain when using the computer.
- Computer users should also be encouraged to avoid spending prolonged hours of work with computer system.

Implications for further study

- During the cause of this research, it was noted that the pain does not only limit to the neck and shoulder but many complained of back, hand, wrist, forearm, upper arm, under arm, low back, eyestrain, upper back pain.
- Studies can be carried out in this area of research work on a large scale with more subjects involved.
- Studies should be carried out on the effect of ergonomics intervention on the prevalence of neck and shoulder [pain complaint among computer users.
- Studies should be carried out on the physical risk factors for the prevalence of neck and shoulder pain complaint among computer users.
- Studies should be carried out extending the research on the different areas on the body including the head , trunk, upper limb, lower limb, upper back and lower back.

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