

RISK FACTORS OF CERVICAL SPONDYLOSIS

Mahmudul Hasan Imran

Bachelor of Science in Physiotherapy (B.Sc. PT)

Session: 2005-2006

BHPI, CRP, Savar, Dhaka- 1343



Bangladesh Health Professions Institute (BHPI)

Department of Physiotherapy

CRP, Savar, Dhaka-1343

Bangladesh

February, 2012

We the undersigned certify that we have carefully read and recommended to the Faculty of Medicine, University of Dhaka, for the acceptance of this dissertation entitled

RISK FACTORS OF CERVICAL SPONDYLOSIS

Submitted by **Mahmudul Hasan Imran**, for partial fulfillment of the requirements for the degree of Bachelor of Science in Physiotherapy (B.Sc. PT).

.....
Mohammad Anwar Hossain
B.Sc. PT (Hons.), Dip. Ortho. Med, MPH
Assistant Professor
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka
Supervisor

.....
Md. Sohrab Hossain
B.Sc. PT (Hons.), Dip. Ortho. Med, MPH
Assistant Professor BHPI &
Head, Department of Physiotherapy
CRP, Savar, Dhaka

.....
Nasirul Islam
B.Sc. PT (Hons.), MPH
Assistant Professor
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka

.....
Md. Shofiqul Islam
B.Sc. PT (Hons.), MPH
Lecturer
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka

.....
Md. Obaidul Haque
B.Sc. PT (Hons.), Dip. Ortho. Med, MPH
Assistant Professor & Course Coordinator
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka

DECLARATION

I declare that the work presented here is my own. All sources used have been cited appropriately. Any mistakes or inaccuracies are my own. I also declare that for any publication, presentation or dissemination of the study. I would be bound to take written consent from my supervisor.

Signature:

Date:

Mahmudul Hasan Imran

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Acknowledgement

First of all, I am grateful to the almighty Allah who gave me life and I am always trying to lead this life honestly. At the same time my thanks with respect to my parents who always want to see me as successful person in the world. Then I gratefully acknowledge to my supervisors Mohammad Anwar Hossain. I am thankful to my respectable course coordinator Md.Obaidul Haque. I want to express my gratitude to all the concerned authorities who allowed me to carry out this study. I also thanks to the member of the board of examiner. They also give me much time to give me most important suggestions to complete this study.

My special thanks for Faruq-Ibn-Sadeq, Shimul Chanda, Rana Bhuiyan, Md. Abdul Fattah, Eliza Afroze and Sharmin Alam who were giving me valuable suggestion and helping me in different stage of the study that made the work easy, relive from difficulties and inspired me to work with enthusiasm.

I would also like to offer very special thanks to one of my teacher Md. Shofiqul Islam who provides me support and advice me about this study. I am thankful to all the staff of the Bangladesh Health Professions Institute (BHPI) Library for their cordial help to find out important books and web address in the computer.

Above all I would like to give thanks to the participants of this study. Lastly thanks to all who always are my well-wisher and besides me as friend without any expectation.

Abbreviations

ADL:	Activity of Daily Living
BHPI:	Bangladesh Health Professions Institute
BMRC:	Bangladesh Medical Research Council
CRP:	Centre for the Rehabilitation of the Paralysed
CSM:	Cervical Spondylotic Myelopathy
NSAIDs:	No Steroidal Anti-Inflammatory Drugs
SPSS:	Statistical Package for the Social Sciences
WHO:	World Health Organization

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Abstract

Purpose: The purpose of the study was to find out the risk factors of cervical spondylosis. *Objective:* To explore the socio-demographic of patients with cervical spondylosis, find out association between sitting posture and cervical spondylosis, evaluate the association between smoking habit and cervical spondylosis, indentify the link between the work pattern and cervical spondylosis and discover the association between the interior designing of office & house. *Methodology:* The design of the study was hospital based case control Study. The researcher used Convenience sampling technique. The Sample Size was 33 for case and 33 for control group, case and control ratio was 1:1. The data collection was collected through using structured questionnaire by face to face interview. The research area of the study was musculoskeletal unit of CRP, Savar and Mirpur branch. Data were analyzed through SPSS 16 version and informs the descriptive statistics for demographic data. *Result:* The investigator found that current job pattern, ADL posture, diabetes smoking habit, sitting posture, sleeping posture and interior designing of office or house are risk factors of cervical spondylosis. *Conclusion:* The important way for prevention of cervical spondylosis including the modification lying and sitting posture for reduce risk factors. By conducting this research it was expected that some of these factors can be identified to minimize the cost of treatment, morbidity, absent from work and moreover physical and psychological distress.

1.1 Background of the Study

Cervical spondylosis is a common degenerative condition of the cervical spine. It is most likely caused by age-related changes in the intervertebral disks. Clinically, several syndromes, both overlapping and distinct, are seen. These include neck and shoulder pain, suboccipital pain and headache, radicular symptoms, and cervical spondylotic myelopathy (CSM). As disk degeneration occurs, mechanical stresses result in osteophytic bars, which form along the ventral aspect of the spinal canal (Rana, 2010).

In contemporary clinical practice, the prevalence of cervical spondylosis in the general population is approximately 15%. The challenge for the primary care specialist is to be able to recognize the more serious disorders that require early referral. Additionally, it is important to have the confidence to institute specific treatment for nonurgent conditions in order to avoid unnecessary referral of patients with generally self-limiting conditions (Rand & Voorhies, 2001).

Most patients who present with neck pain have “non-specific (simple) neck pain,” where symptoms have a postural or mechanical basis. Etiological factors are poorly understood and are usually multifactorial, including poor posture, anxiety, depression, neck strain, and sporting or occupational activities. Neck pain after whiplash injury also fits into this category, provided no bony injury or neurological deficit is present. When mechanical factors are prominent, the condition is often referred to as “cervical spondylosis,” although the term is often applied to all non-specific neck pain (Binder, 2007).

Symptoms caused by cervical spondylosis can be categorized broadly into three clinical syndromes: axial neck pain, cervical radiculopathy, and cervical myelopathy. Patients can have a combination of these syndromes. Axial posterior neck pain occasionally radiates to the shoulder or periscapular region in a non-dermatomal distribution (Rao et al., 2007).

Cervical spondylosis is a common condition of cervical spine in the general population in the 50-60 years age group. The etiology of cervical spondylosis is associated with the aging process, and is closely related to the intrinsic axial load imposed by the weight of the cranium lifelong. Some occupational positions may demand repeated or prolonged flexion, extension or extreme bending of the neck. These may lead to degenerative changes in the cervical spine. Occupational related degenerative change in the cervical spine has recently included in the disease register of occupational disease in Germany (Mahbub et al., 2006).

Axial neck pain is more common in women, has a lifetime prevalence of 66% in North American adults, and 5% of the population has disabling pain at any given time. Cervical radiculopathy refers to pain, sensory findings, or a neurologic deficit in a dermatomal distribution in the upper extremity, with or without neck pain. The annual incidence of cervical radiculopathy was reported to be eighty three per 100,000 populations, whereas the prevalence was found to be 3.5 per 1000 population with a peak incidence in the sixth decade of life. Cervical myelopathy refers to the syndrome of long-tract clinical findings in the upper and lower extremities arising from involvement of the spinal cord by the spondylotic changes in the cervical spinal column. The true incidence is difficult to ascertain because of the subtle findings in its early stages (Rao et al., 2007).

Cervical spondylotic myelopathy is the most serious and disabling condition of this disease. Because many patients have no progressive minor impairment, neck immobilization is a reasonable treatment in patients presenting with minor neurologic findings or in whom an operation is contraindicated. This simple remedy will result in improvement in 30% to 50% of patients (Bruce et al., 1996).

1.2 Justification of the study

Now a day the rate of cervical spodylosis patient are increasing day by day. For this reason of cervical spodylosis patient who has pain on neck and cannot move and perform any work properly. Life become threatens for them. The researcher meet with the qualified and they cannot give me any type of information because there is no study on cervical spondylosis in CRP and they encourage the researcher to select this area.

There is a great demand in indentifying the risk factors of cervical spondylosis to reduce the sufferings of the cervical spondylosis patients. By conducting this research it is expected that some of these factors can be identified to minimize the cost treatment, morbidity, absent from work and moreover physical and psychological distress. Identification of these factors will supplement policy development and infrastructure modification, utilizing ergonomical design methods.

Cervical spondylosis is the most common cause of activity limitation in the persons over the age 50. The identification of the risk factors of cervical spondylosis can help to act as preventive measure to lessen the suffering f community people as a whole.

1.3 Research Question

What are the risk factors of cervical spondylosis?

1.4 Objective

1.4.1 General Objective:

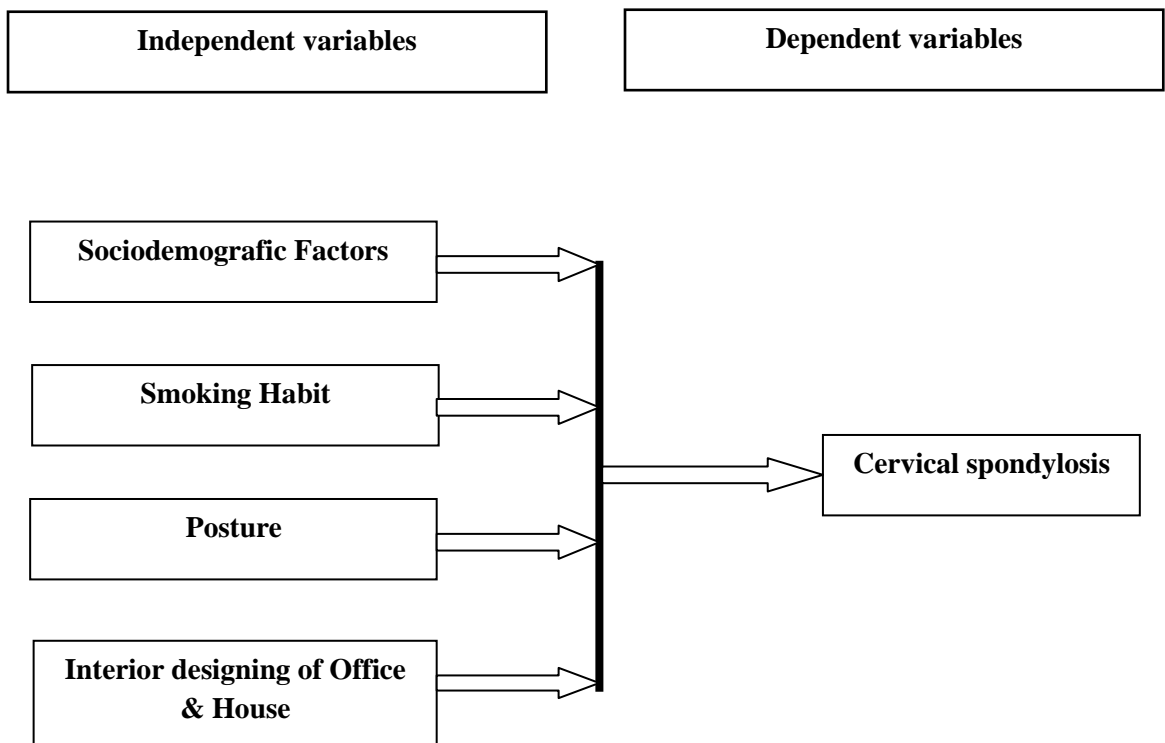
To identify the risk factors of cervical spondylosis.

1.4.2 Specific Objective:

- To explore the socio-demographic of patients with cervical spondylosis.
- To find out association between sitting posture and cervical spondylosis.
- To evaluate the association between smoking habit and cervical spondylosis.
- To identify the link between the work pattern and cervical spondylosis.
- To discover the association between the interior designing of office & house.

1.5 List of Variables

CONCEPTUAL FRAMEWORK



1.6 Operational Definition

Risk Factor- A risk factor is something that increases your chances of getting a disease. Sometimes, this risk comes from something you do. For example, smoking increases your chances of developing colon cancer. Therefore, smoking is a risk factor for colon cancer. Other times, there's nothing you can do about the risk. It just exists. For example, people 50 and older are more likely to develop colon cancer than people under 50. So, age is a risk factor for colon cancer.

Cervical Spondylosis- Cervical spondylosis is a disorder in which there is abnormal wear on the cartilage and bones of the neck (cervical vertebrae). Cervical spondylosis is caused by degenerative changes in the bones and intervertebral disks of the neck. A less technical name for this condition is osteoarthritis of the neck, or degenerative disk disease of the neck.

Activities of daily living- The essential functional activities, those have to be done independently from morning to evening

Stressful job pattern- Has to perform repeated work for more than 8 hours

Smoking- Cigarette smoking and takes betel leaf, zorda and gul

Posture- The pattern of sitting, standing status

Anatomical Texture- Neutral natural body position

Cervical spondylosis

Cervical spondylosis is a disorder in which there is abnormal wear on the cartilage and bones of the neck (cervical vertebrae) (Polston, 2007). It is a common degenerative condition of the cervical spine. It is most likely caused by age-related changes in the intervertebral disks. Clinically, several syndromes, both overlapping and distinct, are seen. These include neck and shoulder pain, sub occipital pain and headache, radicular symptoms, and cervical spondylotic myelopathy (CSM). As disk degeneration occurs, mechanical stresses result in osteophytic bars, which form along the ventral aspect of the spinal canal (Rana, 2010).

Frequently, associated degenerative changes in the facet joints, hypertrophy of the ligamentum flavum, and ossification of the posterior longitudinal ligament occur. All can contribute to impingement on pain-sensitive structures (e.g., nerves, spinal cord), thus creating various clinical syndromes. Spondylotic changes are often observed in the aging population. However, only a small percentage of patients with radiographic evidence of cervical spondylosis are symptomatic (Polston, 2007).

Treatment is usually conservative in nature; the most commonly used treatments are non-steroidal anti-inflammatory drugs (NSAIDs), physical modalities, and lifestyle modifications. Surgery is occasionally performed. Many of the treatment modalities for cervical spondylosis have not been subjected to rigorous, controlled trials. Surgery is advocated for cervical radiculopathy in patients who have intractable pain, progressive symptoms, or weakness that fails to improve with conservative therapy. Surgical indications for cervical spondylotic myelopathy remain somewhat controversial, but most clinicians recommend operative therapy over conservative therapy for moderate-to-severe myelopathy (Rana, 2010).

Frequency**International**

Cervical spondylotic myelopathy is the most common cause of nontraumatic spastic paraparesis and quadriparesis. In one report, 23.6% of patients presenting with

nontraumatic myelopathic symptoms had cervical spondylotic myelopathy (Moore and Blumhardt, 1997).

Race

Cervical spondylosis may affect males earlier than females, but this is not true in all studied populations.

Sex

Irvine et al. (1965) defined the prevalence of cervical spondylotic myelopathy using radiographic evidence. In males, the prevalence was 13% in the third decade, increasing to nearly 100% by age 70 years. In females, the prevalence ranged from 5% in the fourth decade to 96% in women older than 70 years. Another study examined patients at autopsy.

Age

At age 60 years, half the men and one third of the women had significant disease (Holt and Yates, 1966). A 1992 study noted that spondylotic changes are most common in persons older than 40 years. Eventually, greater than 70% of men and women are affected, but the radiographic changes are more severe in men than in women (Rahim and Stambough, 1992).

Risk Factors & Causes

Cervical spondylosis is caused by chronic wearing away (degeneration) of the cervical spine, including the cushions between the neck vertebrae (cervical disks) and the joints between the bones of the cervical spine. There may be abnormal growths or "spurs" on the bones of the spine (vertebrae). These changes can, over time, press down on (compress) one or more of the nerve roots. In advanced cases, the spinal cord becomes involved. This can affect not just the arms, but the legs as well (Devereaux, 2009).

In addition to age and possibly sex, several risk factors have been proposed for cervical spondylosis. Repeated occupational trauma (e.g., carrying axial loads, professional dancing, and gymnastics) may contribute. The role of occupational trauma is controversial, especially in terms of worker's compensation claims and other

related medicolegal clauses. Familial cases have been reported; a genetic cause is possible. Smoking also may be a risk factor. Conditions that contribute to segmental instability and excessive segmental motion (eg, congenitally fused spine, cerebral palsy, Down syndrome) may be risk factors for spondylosis. Cervical spondylosis may be responsible for functional declines in patients with athetoid cerebral palsy (Rana, 2010).

Pathophysiology

Cervical spondylosis is the result of disk degeneration. As disks age, they fragment, lose water, and collapse. Initially, this starts in the nucleus pulposus. This results in the central annular lamellae buckling inward while the external concentric plates at the vertebral body lip. Bands of the annulus fibrosus bulge outward. This causes increased mechanical stress at the cartilaginous end, subperiosteal bone formation occurs next, forming osteophytic bars that extend along the ventral aspect of the spinal canal and, in some cases, encroach on nervous tissue (McCormack and Weinstein, 1996). These most likely stabilize adjacent vertebrae, which are hypermobile as a result of the lost disk material (Hoff and Wilson, 1977). In addition, hypertrophy of the unciniate process occurs, often encroaching on the ventrolateral portion of the intervertebral foramina (Parke 1988). Nerve root irritation also may occur as intervertebral discal proteoglycans are degraded (Rosomoff et al., 1992).

Ossification of the posterior longitudinal ligament, a condition often seen in certain Asian populations, can occur with cervical spondylosis. This condition can be an additional contributing source of severe anterior cord compression (Emery, 2001).

Cervical spondylosis occurs as a result of several important pathophysiological factors. These are static-mechanical, dynamic-mechanical, spinal cord ischemia, and stretch-associated injury. As ventral osteophytes develop, the cervical cord space becomes narrowed; thus, patients with congenitally narrowed spinal canals (10-13 mm) are predisposed to developing cervical spondylosis (Young, 2000).

Age-related hypertrophy of the ligamentum flavum and thickening of bone may result in further narrowing of the cord space (Fehlings and Skaf, 1998). Additionally, degenerative kyphosis and spondylolisthesis are fairly common findings that may further

contribute to cord compression in patients with cervical spondylotic myelopathy (McCormick et al., 2003). Dynamic factors relate to the fact that normal flexion and extension of the cord may aggravate spinal cord damage initiated by static compression of the cord. During flexion, the spinal cord lengthens, resulting in it being stretched over ventral osteophytic bars. During extension, the ligamentum flavum may buckle into the cord, pinching the cord between the ligaments and the anterior osteophytes (Young et al., 1999).

Spinal cord ischemia also most likely plays a role in cervical spondylotic myelopathy. Histopathologic changes seen in persons with cervical spondylotic myelopathy frequently involve gray matter, with minimal white matter involvement—a pattern consistent with ischemic insult. Ischemia most likely occurs at the level of impaired microcirculation (al-Mefty et al., 1993).

Stretch-associated injury has recently been implicated as a pathophysiologic factor in cervical spondylotic myelopathy. The narrowing of the spinal canal and abnormal motion seen with cervical spondylotic myelopathy may result in increased strain and shear forces, which can cause localized axonal injury to the cord (Henderson et al., 2005).

Symptoms

Symptoms often develop slowly over time, but may start suddenly. More common symptoms are- Neck pain (may radiate to the arms or shoulder), Neck stiffness that gets worse over time, Loss of sensation or abnormal sensations in the shoulders, arms, or (rarely) legs, Weakness of the arms or (rarely) legs, Headaches, particularly in the back of the head. Less common symptoms are- Loss of balance, Loss of control over the bladder or bowels (if spinal cord is compressed) (Linda and Vorvick, 2009).

Clinical

History

The various clinical syndromes seen with cervical spondylosis manifest quite differently. Intermittent neck and shoulder pain, or cervicgia, is the most common syndrome seen in clinical practice (McCormack and Weinstein, 1996). This can be a frustrating problem for physicians and patients because often the patient has no

associated neurologic signs. When neurologic deficits are present, diagnostic imaging can often help define the cause. When they are not present, however, imaging findings are not usually helpful because the incidence of radiologic abnormalities is quite high in persons in this age group, even in asymptomatic patients. A large part of the problem is that the source of pain in this situation is poorly understood. This syndrome is possibly related to compression of the sinovertebral nerves and the medial branches of the dorsal rami in the cervical region (Heller, 1992).

The neck pain experienced with cervical spondylosis is often accompanied by stiffness, with radiation into the shoulders or occiput, that may be chronic or episodic with long periods of remission (McCormack and Weinstein 1996). One third of patients with cervicgia due to cervical spondylosis present with headache, and greater than two thirds present with unilateral or bilateral shoulder pain. A significant amount of these patients also present with arm, forearm, and/or hand pain (Heller, 1992).

Perhaps more thoroughly understood than the above-discussed syndromes is radiculopathy associated with cervical spondylosis. The most commonly involved nerve roots are the sixth and seventh nerve roots, which are caused by C5-C6 or C6-C7 spondylosis, respectively. Patients usually present with pain, paresthesias or weakness, or a combination of these symptoms. The vast majority of these patients present without a history of trauma or other recalled precipitated cause.

The pain is usually in the cervical region, the upper limb, shoulder, and interscapular region. At times, the pain may be atypical and manifest as chest pain (pseudoangina) or breast pain. Usually, the pain is more frequent in the upper limbs than in the neck, although it is frequently present in both areas (Ellenberg et al. 1994). Cervical radiculopathy is not usually associated with myelopathy (McCormack and Weinstein, 1996).

Another poorly understood clinical syndrome seen with cervical spondylosis is chronic suboccipital headache. Although the C1 thru C3 dermatomes are represented on the head and it would seem likely that occipitoatlantal and atlantoaxial degeneration would cause pain in these areas, no contributions to these joints occur

from the dorsal rami of C1-C3. In addition, the greater occipital nerve cannot usually be compressed by bony structures. Regardless, headaches can be the dominant symptom in a patient with degenerative cervical disease. The headaches are usually suboccipital and may radiate to the base of the neck and the vertex of the skull (Heller, 1992).

Cervical spondylotic myelopathy is the most common cause of nontraumatic paraparesis and tetraparesis. The process usually develops insidiously. In the early stages, patients often present with neck stiffness. Patients also may present with stabbing pain in the preaxial or postaxial border of the arms (Young, 1999). Patients with a high compressive myelopathy (C3-C5) can present with a syndrome of "numb, clumsy hands," for which the patient describes difficulty writing, a loss of manual dexterity, nonspecific and diffuse weakness, and abnormal sensations (McCormack and Weinstein, 1996). Those patients with a lower myelopathy typically present with a syndrome of weakness, stiffness, and proprioceptive loss in the legs. These patients often exhibit signs of spasticity (Young, 1999).

Weakness or clumsiness of the hands may be seen in conjunction with weakness in the legs. Motor loss in the hands with relative sparing of the legs, however, is a relatively rare syndrome. Symptoms are commonly asymmetric in the legs. Loss of sphincter control and urinary incontinence are rare; some patients, however, report urinary urgency, frequency, and/or hesitancy (McCormack and Weinstein, 1996). Cervical spondylotic myelopathy significantly affects patients' quality of life. A recent study reported that greater than one third of patients with cervical spondylotic myelopathy have anxious or depressed moods related to their decreased mobility (Stoffman et al., 2005).

Another syndrome that may be seen in relation to cervical spondylosis is central cord syndrome. This syndrome typically occurs when an elderly patient experiences an acute hyperextension injury with preexisting acquired stenosis due to ventral osteophytes and infolding of redundant ligamentum flavum, resulting in acute cord compression. Patients usually present with a history of a blow to the forehead. The syndrome consists of greater upper extremity weakness than lower extremity weakness, varying degrees of sensory disturbances below the lesion, and myelopathic

findings such as spasticity and urinary retention. Rarely, dysphagia or airway dysfunction has been reported secondary to cervical spondylosis (Farooqi et al., 2006).

Dysphagia may occur when large anterior osteophytes cause mechanical compression of the esophagus or periesophageal inflammation causes motion over the osteophytes. Conservative therapy with anti-inflammatory medications and other modalities has been advocated for mild-to-moderate cases of dysphagia, while surgery has been reserved for more severe cases (Sobol and Rigual, 1984).

Physical

Examination findings include neck pain, radicular signs, and myelopathic signs. Patients with neck pain from spondylosis often present with neck stiffness. This is a nonspecific sign, and other causes of neck pain and stiffness (eg, myofascial pain, intrinsic shoulder pathology) must be considered and excluded (McCormack and Weinstein, 1996). If the history is compatible with cervical radiculopathy, carefully search for signs of muscle atrophy in the supraspinatus, infraspinatus, deltoid, triceps, and first dorsal interosseus muscles. Winging of the scapula also may be present because it can occur with C6 or C7 radiculopathy. Palpate all muscles because this may allow earlier detection of wasting than visualization can provide. If weakness is detected in either 1 myotomal distribution or 2-3 peripheral nerves, peripheral nerve injury can likely be excluded as the cause. Muscle testing is important because muscle findings have more specificity than sensory or reflex findings (Young, 1999).

Perform a detailed sensory and reflex examination in every patient who presents with a history suggestive of cervical spondylosis. Note that radicular findings often do not adhere strictly to textbook dermatomal charts. Patients often experience more pain proximally in their limbs, while, distally, paresthesias dominate. Look for physical evidence of other causes of radiculopathy-type symptoms (eg, tenderness lateral to the neck in the supraclavicular fossa, Tinel sign) (McCormich et al., 2003).

The neck compression test (Spurling test or sign), if positive, is useful when assessing a patient for cervical radiculopathy. This test is best performed by having the patient actively extend his or her neck, laterally flex, and rotate to the side of the pain while

sitting. Next, use careful compression by slight axial loading. This maneuver works by narrowing the ipsilateral neural foramina during flexion and rotation, while the initial extension causes posterior disk bulging. While this maneuver has a low sensitivity for cervical radiculopathy, it has a specificity of nearly 100%. Other useful tests are the axial manual traction test and the shoulder abduction test (Young, 2000).

In cervical spondylotic myelopathy, the most typical examination findings are suggestive of upper motor dysfunction, including hyperactive deep tendon reflexes, ankle and/or patellar clonus, spasticity (especially of the lower extremities), the Babinski sign, and the Hoffman sign. The Hoffman sign is a reflex contraction of the thumb and index finger after nipping the middle finger. Although this sign is usually present with corticospinal tract dysfunction, unlike the Babinski sign, it can also be present in generalized hyperreflexic states and in neurosis. It also may be found (usually bilaterally and incomplete) in persons without cervical spondylotic myelopathy. Thus, this sign is only valuable if it is associated with other upper motor neuron–related findings. The Hoffman sign is best elicited by positioning the patient's hand at rest and then stabilizing the proximal phalanx between the examiner's index and middle finger; with the examiner's thumb, the patient's distal middle finger is flicked downward. The sensitivity of this examination maneuver may be increased by examining the patient during multiple full flexions or extensions of the neck (dynamic Hoffman sign) (Heller, 1992).

Another occasionally useful test is the pectoralis muscle reflex. This is elicited by tapping the pectoralis tendon in the deltopectoral groove, which causes adduction and internal rotation of the shoulder if hyperactivity is present. A positive result suggests compression in the upper cervical spine (C2-C4). If the patient exhibits diffuse hyperreflexia, then the jaw jerk may distinguish an upper cervical cord compression from lesions that are above the foramen magnum. In patients with cervical spondylotic myelopathy, weakness is most commonly seen in the triceps and/or hand intrinsic muscles, where upper extremity symptoms typically begin. Wasting of the intrinsic hand musculature is also a typical finding (Stoffman et al., 2005).

A thorough examination of patients' hands should be performed. By having the patient make a fist and release it 20 times in 10 seconds, impairment or clumsiness may be

observed that may suggest cervical spondylotic myelopathy. The finger escape sign may also be present. To assess this, the patient holds his or her fingers extended and adducted. If the ulnar digits drift into abduction and flexion within 30-60 seconds, cervical spondylotic myelopathy may be present. A classic finding with examination of the lower extremities is proximal motor weakness, most commonly in the iliopsoas, followed by the quadriceps femoris; distal weakness is a less common finding. The finding of lower extremity weakness and lower extremity upper motor neuron signs but absent upper extremity symptoms and signs should trigger a workup for thoracic cord pathology (Kanbay et al., 2006).

Examine gait during any neurologic examination whenever possible. Patients with cervical spondylotic myelopathy typically exhibit a stiff or spastic gait, especially later in the course of their disease. Another helpful sign is the Lhermitte sign. This consists of electric shock-like sensations that run down the center of the patient's back and shoot into the limbs during flexion of the neck. This sign is not specific for cervical spondylotic myelopathy and classically is attributed to posterior column dysfunction. Other causes of the Lhermitte sign include multiple sclerosis, tumors, and other compressive pathology (Farooqi et al., 2006).

Sensory abnormalities in cervical spondylotic myelopathy have a variable pattern upon examination. Loss of vibratory sense or proprioception in the extremities can occur, particularly in the feet. Spinothalamic sensory loss may be asymmetric. Diabetes mellitus or other metabolic causes of peripheral neuropathy can confound the sensory examination. Perform a complete motor examination. Wasting of the intrinsic hand musculature is a classic finding in persons with cervical spondylotic myelopathy (Sobol and rigual, 1984).

Diagnosis of Cervical spondylosis

Diagnosing Cervical Spondylosis with Flexibility Tests and X-Rays

Doctors diagnose cervical spondylosis by means of neck flexibility tests and imaging techniques. Neck flexibility tests are used to identify any instability that may be present in the neck. The tests include: tilting head to both sides and rotating head to either side. Imaging diagnostics of the neck are performed to see bone spurs and other anatomical changes associated with the condition. The imaging methods used include

x-rays, which are an inexpensive way to see the narrowing of the canal and disk space, and the presence of arthritis in people who have the symptoms of cervical spondylosis. X-rays also give visual information about the integrity of the cervical curve (Asher, 2010).

Diagnosing Cervical Spondylosis with MRIs CT Scans and other Tests

Other imaging diagnostics include: MRIs – Particularly useful for viewing the condition of the spinal nerves and the spinal cord. MRIs take pictures from many angles. CT scans provide good views of the bones, especially where they encroach on nervous tissue due to their reshaping over time. Myelogram – this imaging technique enhances the visibility of x-rays. They are especially good for seeing problems located at nerve roots. In cases of Down syndrome and other conditions associated with atlantotaxial instability, visual images of the cervical spine in flexion and in extension might be taken to assist the doctor in determining the direction of treatment (Stuff, 2010).

Sometimes electrical activity of the nerves and/or spinal cord is measured (by means of somatosensory evoked potentials or motor evoked potentials) to diagnose radiculopathy or myelopathy. Such tests may help to determine the presence of myelopathy, as well as the length of time the cervical spondylosis has been present in the spine, and if it is the cause of any found nerve root problem (kanbay et al., 2006).

Complications

Complication of the cervical spondylosis are Chronic neck pain, Inability to hold in feces (fecal incontinence) or urine (urinary incontinence), Progressive loss of muscle function or feeling and Permanent disability (occasional) (Linda and Vorvick, 2009).

Management

Pharmacological management

NSAIDs

Despite the lack of any clinical trials in patients with cervical spondylitic symptoms, NSAIDs are widely used in the management of axial neck pain and radicular syndromes. Conceptually, NSAIDs are used because of their combined analgesic and anti-inflammatory properties (koes et al., 1997).

Nonopioid and Opioid Analgesics

By providing effective pain control, analgesics may permit better compliance with active exercise programs used in nonoperative management of cervical spondylosis. Acetaminophen has been the preferred first choice for mild-to-moderate pain because of its apparent safety and efficacy comparable to NSAIDs (Rahme et al., 2002).

Muscle Relaxants

The rationale for the use of muscle relaxants in patients with cervical spondylosis and neck pain is based on the assumption of associated reactive paraspinal and trapezius muscle spasm that may augment symptoms. In addition, available centrally acting agents, including baclofen, cyclobenzaprine, carisoprodol, and tizanidine, produce some degree of sedation, potentially improving pain-disrupted sleep (Aker et al., 1996).

Physiotherapy Management

Physical therapy approaches to cervical spine disorders include active, exercise-oriented treatment and modalities, such as ultrasound, thermal therapy, and traction. Active exercise programs in cervical spondylosis patients have been studied primarily in patients with neck pain.

A recent structured literature review found three randomized studies suggesting that supervised isometric exercises or proprioceptive reeducation (slow neck movements) produced clinically important improvement in pain and functional parameters (Panel, 2001). Another recent study in 183 patients with neck pain of more than 2 weeks duration compared physical therapy exercises, manual therapy, and continued care by a general practitioner in a randomized, controlled trial (Hoving et al., 2002).

Manual therapy consisted of hands-on mobilization using low velocity passive movement of facet joints within the normal range of motion. At the 7-week follow-up visit, manual therapy scored significantly better on most outcome measures than the other interventions. On the basis of patient age (mean, approximately 45 yr) and duration of symptoms (50% had symptoms for less than 6 wk), this study probably included patients with primarily myofascial pain in addition to spondylosis. Another similar trial comparing intensive exercise training, physiotherapy, and chiropractic

manipulation in 119 patients with neck pain for longer than 3 months found no differences in any outcome measures, including pain level, range of motion, and disability (Jordan et al., 1998).

Thermotherapy may provide brief symptomatic relief, but has not been shown to affect eventual outcome. One small randomized controlled trial comparing therapeutic ultrasound with placebo in patients with myofascial neck pain found no difference in pain relief (Lee et al., 1997).

Surgery for Cervical Spondylosis

Most of the time, surgery is a very extreme solution, and not always a successful one. From a surgeon's perspective, there are numerous techniques that can be used, but as yet, medical research has not identified any one of them as the best choice. Generally, a laminectomy, which goes in through the back or an anterior cervical decompression from the front may be done. Studies show that a surgical approach from the back does not always yield the best results in terms of getting out all the bone spurs and pieces of disk that tend to be located further toward the front. Sometimes a spinal fusion is performed in the same operation. Discussing the options with your doctor prior to surgery is imperative (Asher, 2011).

Expectations (prognosis)

Most patients with cervical spondylosis will have some long-term symptoms. However, they respond to non-surgical treatments and do not need surgery (Linda and Vorvick, 2009).

Prevention

Many cases are not preventable. Preventing neck injury (such as by using proper equipment and techniques when playing sports) may reduce your risk (Feske and Cochrane, 2007).

3.1. Study Design

Case-control study design was used for identifying the risk factors for cervical spondylosis. People with cervical spondylosis were selected as case. All individual cases were unmatched with a control. The entire sample was then searched for the exposure.

3.2 Study site

Musculoskeletal unit of the Centre for the Rehabilitation of the paralysed (CRP) - Savar and Mirpur was selected as the as the study site.

3.3 Study area

Musculoskeletal area was selected as the as the study area. The investigator thought that this place was easy to obtain desire data for his study. This place comes to cervical spondylosis patients for physiotherapy treatment from different area of Bangladesh, so the investigator selected this place.

3.4 Study population and sample population

All patients with cervical spondylosis in Bangladesh were the target population and sample population were those who came to CRP to receive physiotherapy treatment during the investigator study time from February 2011 to August 2011.

3.4.1 Sampling Procedure

The investigator used the convenience sampling technique because considering the inclusion – exclusion criteria and the number of patients coming to musculoskeletal unit: it would be difficult to find the expected number of subjects. This technique was more feasible, less time consuming and expensive for the investigator to obtain relevant information.

3.4.2 Inclusion criteria

- Patients with cervical spondylosis who were attending in CRP for physiotherapy treatment as a case.
- Patients without cervical spondylosis who were attending in CRP for physiotherapy treatment as a control.
- Cervical spondylosis that was confirmed was diagnosed by x-ray or MRI.
- All male and female were same priorities.

Male and female had different anatomical, physiological changes as well as different intensity, frequency and pattern of activity. Inclusion of males and females may be more comprehensive in identifying the risk factors.

3.4.3 Exclusion criteria

- Patients with cervical spondylosis & other serious associated diseases.
- Subject who were unconscious, cognitive problem.

3.5 Sample size

There were 33 cases and 33 controls, were selected as sample in the study.

Formula:

$$q = 1 - p$$
$$P1 = \frac{PoR}{1 + Po(R - 1)}$$
$$P = \frac{P1 + Po}{2}$$
$$n = \frac{2pq(Za + Zb)^2}{(P1 - Po)^2} = 543$$

Here,

The quantities Za and Zb are values from the slandered normal distribution.

Relative frequency of exposure among control in the target population, Po was 5%

Hypothesized minimum relative risk to detected by the study, R = 2

Level of significance, a = 0.05% (Za = 1.96)

Power of the study, = 80% (Zb = 0.84)

Number of the calculated sample = n

Finishing the calculating estimated sample size was 543

The investigator taken 66 participants that were 33 cases and 33 were controls due to time limit and able ability of the participants in this time.

3.6 Data collection methods and tools

Data were collected by direct interview using the questionnaire and from the reports of cervical spine X-rays. Anteroposterior and lateral view radiographs were used for the assessment of the cervical spine. The questions were divided into five sections which almost covered all issues regarding risk factors of cervical spondylosis including age, sex, occupation, religious status, residential area, family income, hobby, trauma, cervical spine surgery, current job pattern, ADL, smoking, substance abuse, life style, posture, using pillows, anatomical texture of the body, interior design of the office and house and sports. Beside this, paper, pen, pencil, computer, printer and calculator comprehensive field note would be used as the materials of data collection.

3.7 Data management and analysis

Measurement of association

Exposure	Cervical Spondylosis	
	Yes (Case)	No (Control)
Yes	a	b
No	c	d
Odds of exposure = ad / bc		

Table-1: Measurement of Odds ratio

In the case-control study, there was not calculate the incidence rate of the disease so actual relative could not be obtained. The measure of the association between exposure and occurrence of the disease of the case-control study was Odds ratio. The ratio of Odds of then exposure in diseased participants to the Odds of the exposure in the non disease participants was calculated as an Odds ratio. According to the above mention was an example of a calculated Odds ratio.

SPSS 16 version was used to analyze data. Data was analyzed in the form descriptive statistics for demographic data. Odds ratio was computed to determine how much risk

there was in presence of certain exposure compared to those who did not have that exposure.

Name of the factors	Number of Cases	Number of control	ODD Ratio (OR)	95% CI
Stressful current Job pattern				
Do not maintain ADL Posture				
Presence of Diabeties				
Presence Smoking Habit				
Poor Sitting posture				
Poor Sleeping posture				
Using number of pillows				
Default Interior Design of office or house				

Table-2: The individual factors of cervical spondylosis

3.8 Quality control and assurance

The format of the questionnaire was purely structured, thus it enabled a definitive answer. The questionnaire were developed according to the literature search and peer review for reliable questionnaire. The investigator tried to avoid selection bias due to strictly maintained inclusion and exclusion criteria. Both cases and control were well defined in this study to the avoid conflict the selection the case and control. The data were collected when the experience physiotherapist who was indentify Cervical spondylosis patients as a case.

3.9 Inform Consent

The aims and objectives of this study should be informed to the subjects verbally. Before conducting research with the respondents, it is necessary to gain consent from

the subjects. The researcher gave the consent form to the subject and explained them. The subjects had the rights to withdraw themselves from the research at any times. It should be assured the participant that his or her name or address would not be used. The information of the subjects might be published in any normal presentation or seminar or writing but they would not be identified. The participant will also be informed or given notice that the research result would not be harmful for them. It would be kept confidential. Every participant has the right to discuss about his or her problem with senior authority.

3.10 Ethical considerations

The proposal of the study was approved by the ethical committee of the member of faculty of Physiotherapy Department. The investigator would follow the guideline given by local ethical review committee and followed the WHO & BMRC guidelines. The participants should be assuring that the information will be kept strictly maintained the confidentiality. The informed consent should be taken from the participants and the participants willingly participate in the study.

3.11 Limitation of the study

There were a lot of limitations in this study. They were:

- First of all, there was lack of knowledge when doing research which had a great deal of impact on the study.
- Collected data were hospital based and collected from tertiary level hospital. These were not reflecting the whole population in generalizing and not found the real picture properly in this study.
- In the study data was collected from only CRP, Savar, Dhaka. If investigator got a larger data, it may make the result more valid and reliable.
- For receiving physiotherapy treatment, only few cervical spondylosis came to the physiotherapy department at CRP. Most of the patients were not represented all over populated of Bangladesh, so most of the cervical spondylosis patients did not participate in this study.
- The investigator observed only common factors of the cervical spondylosis in this study and did not specify all of the factors properly. So to specify all of the factors properly may find more specific association of the factors.

- The researcher was a 4th year B.Sc. in physiotherapy student and this was his first research project. He had limited experience with techniques and strategies in terms of the practical aspects of research. As it was the first survey of the researcher so might be there were some mistakes by the researcher.

In this study there were 66 participants. Among them 33 participants were in case group and 33 participants were in control group. The analysis was done by the SPSS 16 version.

Socio-demographic Information

4.1 Age Group

Among the 66 participants 17 participants were between 13-35 years, 16 were between 36-44 years, 14 were between years 45-49 years and 19 were greater than 50 years. There mean age 42.27 years and minimum age was 13 years and maximum age was 69 years. In percentage 25.8% participants were between 13-35 years, 24.2% were between 36-44 years, 21.2% were between years 45-49 years and 28.8% were greater than 50 years (Figure-1).

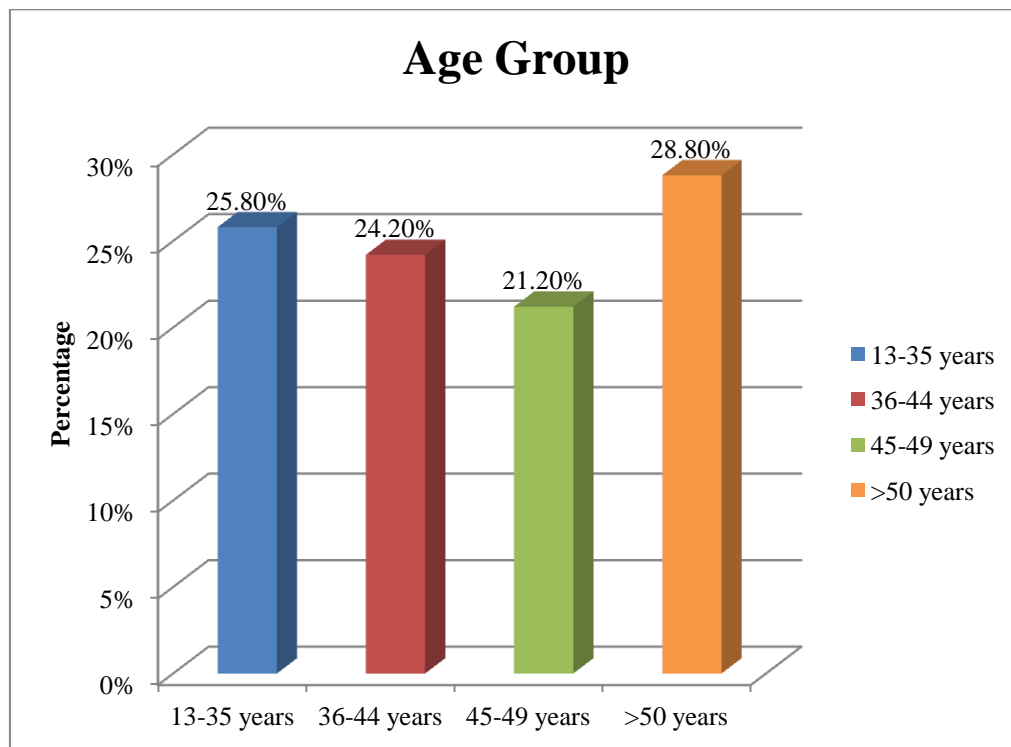


Figure-1: Age group of the participants

4.2 Male Female ratio

Among the 66 participants 36 were female and 30 were male. In percentage 54.5% participants were female and 45.5% were male (Figure -2).

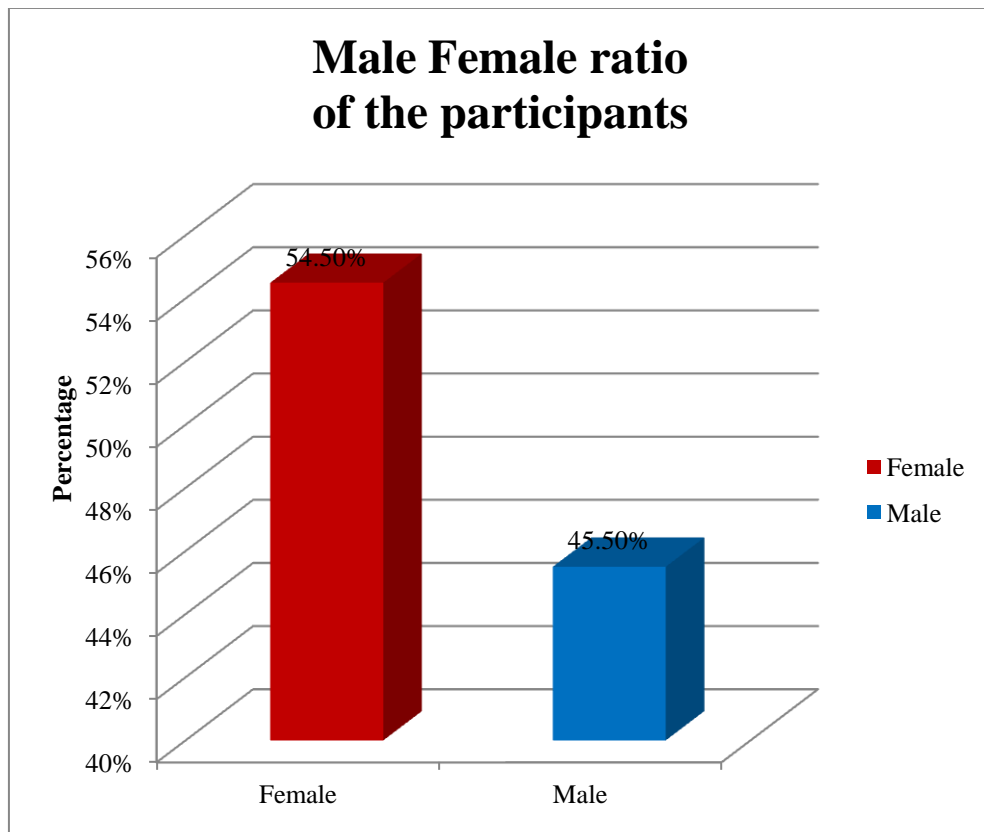


Figure - 2: Male Female ratio of the participants

4.3 Religion of the Participants

Among the 66 participants 60 participants were Islam, 5 participants were Hinduism and 1 participant are Christian. In percentage 90.9% participants were Islam, 7.6% participants were Hinduism and 1.5% participant were Christian (Figure-3).

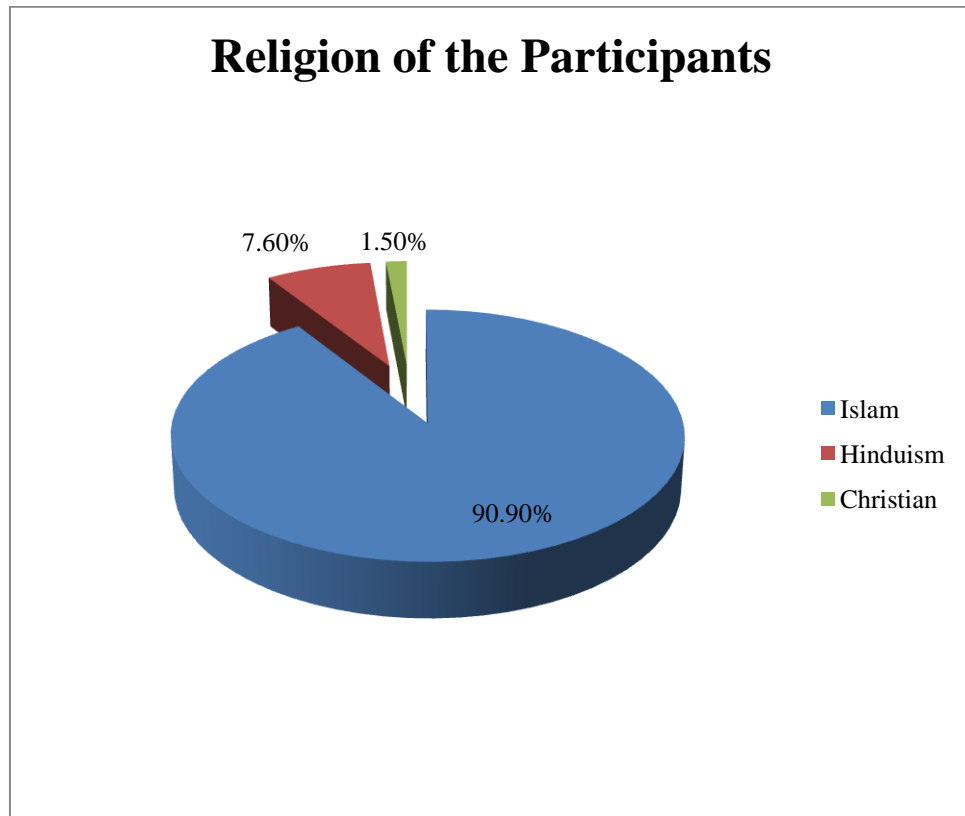


Figure - 3: Religion of the participants

4.4 Marital Status of the participants

Among the 66 participants 57 participants were married, 6 participants were unmarried and 3 participants are widow. In percentage 90.9% participants were married, 7.6% participants were unmarried and 1.5% participant was widow (Figure-4).

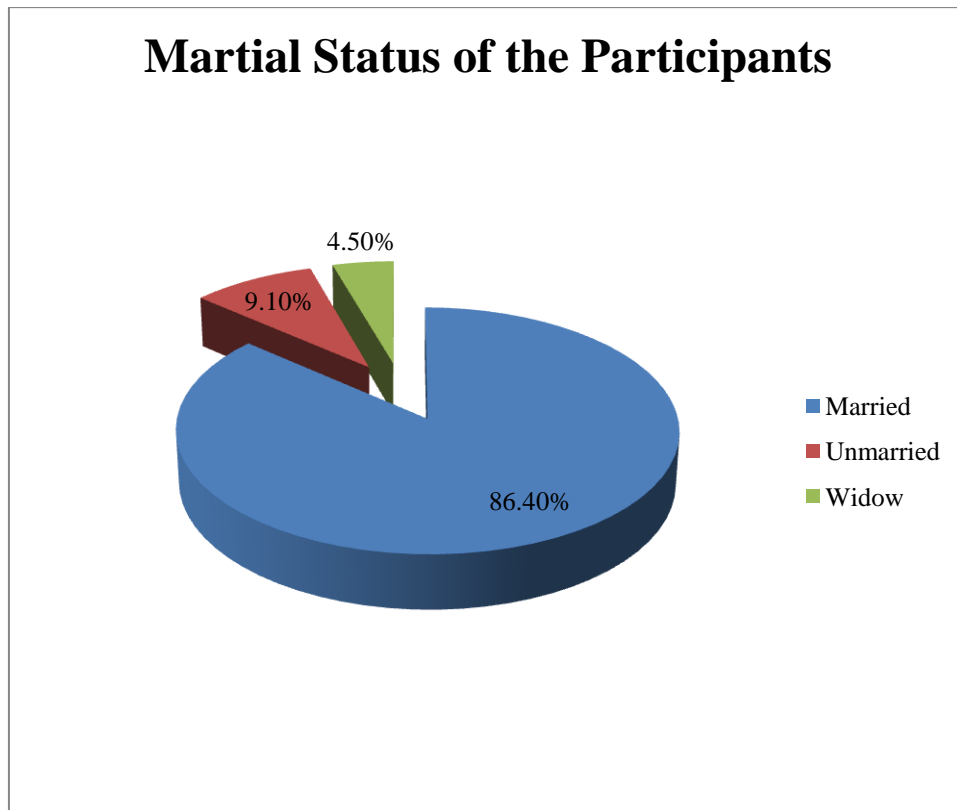


Figure - 4: Marital Status of the participants

4.5 Educational Status of the participants

Among the 66 participants 6 participants never attended school, 4 participants had some primary education, 8 participants completed primary education, 11 participants had some secondary education, 18 participants completed secondary education, 8 participants had higher secondary education, 10 participants have Bachelor or above and 1 participants had others. In percentage 9.1% participants never attended school, 6.1% participants had some primary education, 12.1% participants completed primary education, 16.7% participants had some secondary education, 27.3% participants completed secondary education, 12.1% participants had higher secondary education, 15.2% participants have Bachelor or above and 1.5% participants had others (Figure-5).

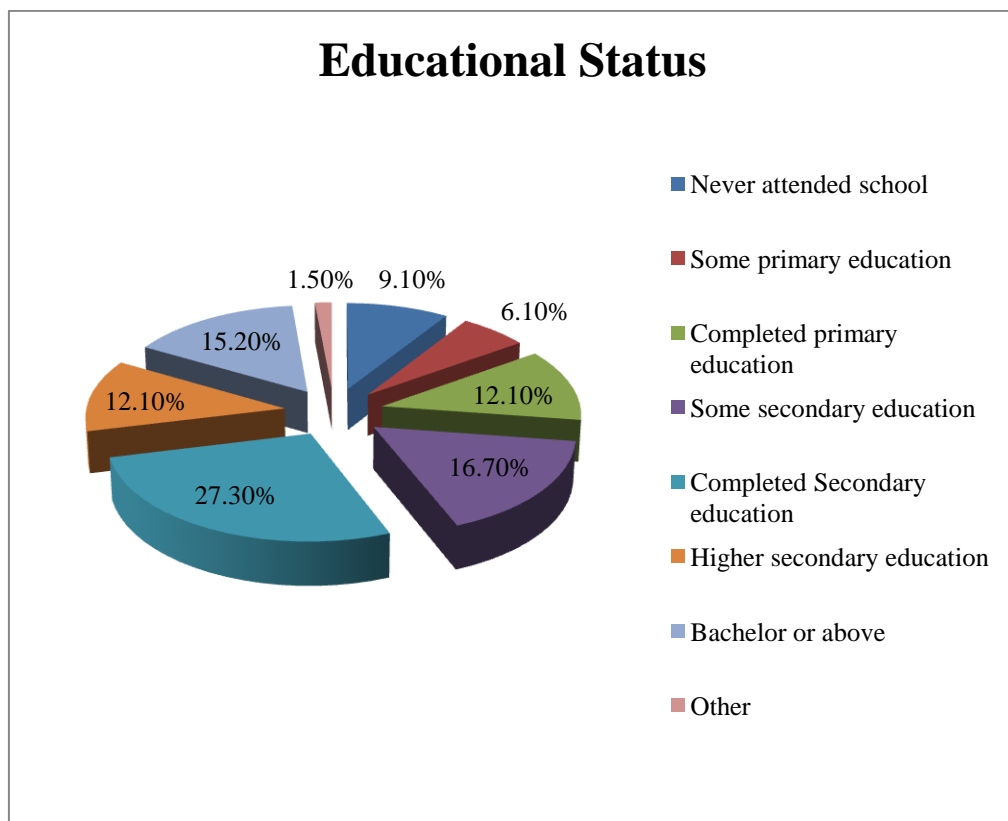


Figure - 5: Educational Status of the participants

4.5 Occupation

Among the 66 participants 1 participant was rickshaw puller, 15 participants were service holder, 3 participants were farmer, 8 participants were businessman, 2 participants were day labor, 27 participants were housewife, 1 participants was teacher, 3 participants were student and 6 participants were other occupation. In percentage 1.5% participant was rickshaw puller, 22.7% participants were service holder, 4.5% participants were farmer, 12.1% participants were businessman, 3.0% participants were day labor, 40.9% participants were housewife, 1.5% participants was teacher, 4.5% participants were student and 9.1% participants were other occupation (Figure-6)

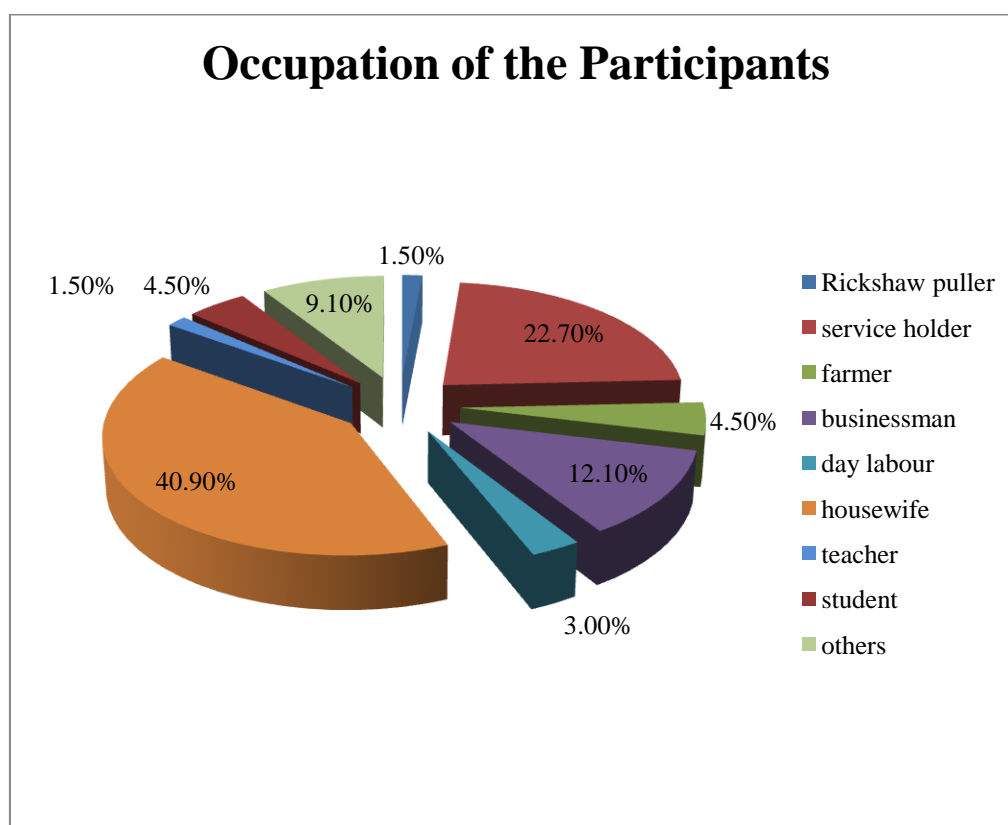


Figure - 6: Occupation of the participants

4.6 Hobby

Among the 66 participants 8 participants like gardening, 6 participants like reading, 2 participants like playing, 43 participants like watching television and 7 participants like other works in their hobby. In percentage 12.1% participants like gardening, 9.1% participants like reading, 3.0% participants like playing, 65.2% participants like watching television and 10.6% participants like other works in their hobby (Figure-7).

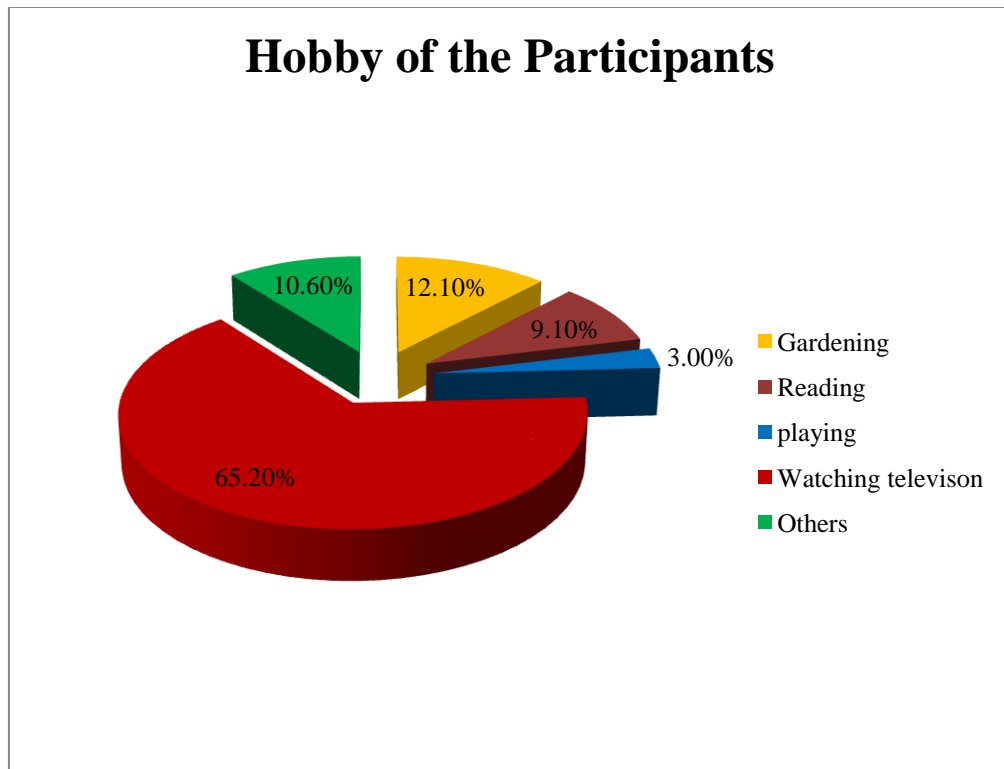


Figure - 7: Hobby of the participants

4.7 The individual factors of cervical spondylosis results were shown this table as below

Name of the factors	Number of Cases	Number of control	ODD Ratio (OR)	95% CI
Stressful Current Job pattern	5	3	1.786	0.390, 8.174
Do not maintain ADL Posture	27	18	3.75	1.225, 11.481
Presence of Diabetics	20	19	1.134	0.425, 3.026
Presence Smoking Habit	21	19	1.289	0.479, 3.469
Poor Sitting posture	22	4	14.5	4.066, 51.709
Poor Sleeping posture	12	1	18.286	2.21, 151.27
Using number of pillows	27	31	0.29	0.054, 1.56
Default Interior Design of office or house	5	4	6.042	1.731, 21.086
Attending Sports	32	32	1.00	0.060,16.690

Table-3: The individual factors of cervical spondylosis

Job pattern

From the table it is observed that the total participants of this study were 66 where 33 were case and 33 were control, among them 5 were in physical and mentally stressful job and 28 were in healthy and friendly environment in the case group. On the other hand 3 were in physical and mentally stressful job and 30 were in healthy and friendly environment in the control group. Calculated odds ratio for job pattern is 1.786 (Table-3) which means there was association between the job pattern in the work place and cervical spondylosis that is 1.786 times more possible chance to occur cervical spondylosis due to physical and mentally stressful job and 95% CI was 0.390 and 8.174.

ADL Posture

From the table it is observed that the total participants of this study were 66 where 33 were case and 33 were control, among them 27 participants did not maintain posture

during ADL and 6 participants does maintain posture during ADL in the case group. On the other hand 18 participants did not maintain correct posture during ADL and 6 participants does maintain posture during ADL in the control group. Calculated odds ratio for maintain posture during ADL is 3.75 (Table-3) which means there was strong association between the maintaining posture during ADL and cervical spondylosis that is 3.75 times more possible chance to occur cervical spondylosis due to not maintain posture during ADL and 95% CI was 1.225 and 11.481.

Diabetes

From the table it is observed that the total participants of this study were 66 where 33 were case and 33 were control, among them 20 participants had diabetes and 13 participants had no diabetes in the case group. On the other hand 19 participants had diabetes and 14 participants had no diabetes in the control group. Calculated odds ratio form non diabetes is 1.134 (Table-3) which means there was association between the diabetes and cervical spondylosis that is 1.134 times more possible chance to occur cervical spondylosis due to diabetes and 95% CI was 0.425 and 3.026.

Smoking

From the table it is observed that the total participants of this study were 66 where 33 were case and 33 were control, among them 21 participants had the habit of smoking and 12 participants had no habit of smoking in the case group. On the other hand 19 participants had the habit of smoking and 14 participants had no habit of smoking in the control group. Calculated odds ratio form non smoker is 1.289 (Table-3) which means there was association between the smoker and cervical spondylosis that is 1.134 times more possible chance to occur cervical spondylosis due to smoking and 95% CI was 0.479 and 3.469.

Sitting posture

From the table it is observed that the total participants of this study were 66 where 33 were case and 33 were control; among them 22 participants maintain poor posture during sitting and 11 participants maintain good posture during sitting in the case group. On the other hand 4 participants maintain poor posture during sitting and 29 participants maintain good posture during sitting in the control group. Calculated odds

ratio for maintain posture during sitting is 14.5 (Table-3) which means there was strong association between the maintaining posture during sitting and cervical spondylosis that is 14.5 times more possible chance to occur cervical spondylosis due to maintain poor posture during sitting and 95% CI was 4.066 and 51.709.

Sleeping posture

From the table it is observed that the total participants of this study were 66 where 33 were case and 33 were control; among them 12 participants maintain poor posture during sleeping and 21 participants maintain good posture during sleeping in the case group. On the other hand 1 participant maintain poor posture during sleeping and 32 participants maintain good posture during sleeping in the control group. Calculated odds ratio for maintain posture during sleeping is 18.286 (Table-3) which means there was strong association between the maintaining posture during sleeping and cervical spondylosis that is 18.286 times more possible chance to occur cervical spondylosis due to maintain poor posture during sleeping and 95% CI was 2.210 and 151.27.

Using Number of pillows

From the table it is observed that the total participants of this study were 66 where 33 were case and 33 were control; among them 27 participants using one pillow during sleeping and 6 participants using two pillows during sleeping in the case group. On the other hand 31 participants using one pillow during sleeping and 2 participants using two pillows during sleeping in the control group. Calculated odds ratio for using pillows during sleeping is 0.29 (Table-3) which means there was no association between the using pillows during sleeping and cervical spondylosis that is 0.29 times more possible chance to protect cervical spondylosis due to using one pillow during sleeping and 95% CI was 0.054 and 1.56.

Interior Design

From the table it is observed that the total participants of this study were 66 where 33 were case and 33 were control; among them 5 participants had default interior designing of office or house and 18 participants had proper agronomical designing of office or house in the case group. On the other hand 4 participants had default interior designing of office or house and 29 participants had proper agronomical designing of

office or house in the control group. Calculated odds ratio for interior designing of office or house is 6.042 (Table-3) which means there was strong association between the interior designing of office or house and cervical spondylosis that is 6.042 times more possible chance to occur cervical spondylosis due to default interior designing of office or house and 95% CI was 1.731 and 21.086.

Sports

From the table it is observed that the total participants of this study were 66 where 33 were case and 33 were control; among them 32 participants not play and 1 participant use to play in case group. On the other hand 32 participants not play and 1 participant use to play in control group. Calculated odds ratio for sports is 1.00 (Table-3) which means there was no association between the sports and cervical spondylosis and 95% CI was 0.060 and 16.690.

In this study there were 33 cases and 33 number of control that means case: control was 1:1 and hospital based unmatched setting. Intended of this study to determine the risk factors affecting the cervical spondylosis with considering the variables like socio-demographic and socio-economic variables, current job pattern, posture of ADL, diabetes, habit of smoking, life style, sitting posture, sleeping posture, using number of pillow during sleeping and interior designing of office and house.

The investigator found the positive association of the cervical spondylosis and current job pattern, ADL posture, diabetes smoking habit, sitting posture, sleeping posture and interior designing of office or house in the study. There was no association between cervical spondylosis and using pillow and sports.

Rana (2010) observed that at age 60, half the men and one third of the women had cervical spondylosis. Linda and vorvick (2009) agreed that by age 60, most women and men shows signs of cervical spondylosis on x-ray. Cervical spondylosis is usually reported in persons aged more than 50 years. In this study the investigator had found the similar age group more incidence of the cervical spondylosis. He found that most age frequency of the case group of the study was more than 50 years that was 28.8%.

A 1992 study noted that spondylotic changes were most common in persons older than 40 years. Eventually, greater than 70% of men and women were affected, but the radiographic changes were more severe in men than in women (Rana, 2010). In this study the researcher found approximately similar result that was male were more affected then female in cervical spondylosis.

Some occupational positions may demand repeated or prolong flexion and extreme bending of the neck. These may lead to degenerative changes in the cervical spine. Occupation related degenerative change in the cervical spine had recently been included in the disease register of occupational disease in Germany. Cervical spondylosis usually produces intermittent neck pain in middle aged and elderly patients (Mahbub, 2006). But occupation of the most participants was house wife and

then service holder; they had to stay in flexion and neck bending position for long time of the day. In this study the researcher noticed that house wives were the most suffers of cervical spondylosis.

Some positions of the cervical spine like repeated or prolong flexion and extreme bending of the neck lead to degenerative changes in the cervical spine like cervical spondylosis (Mahbub, 2006). The hobby of the most participants was watching television. During watching television most of them were in abnormal position of the cervical spine. As it was their hobby they spend long time with flexion and bending of the neck that leads to cervical spondylosis.

During ADL, some positions of the cervical spine like repeated or prolong flexion and extreme bending of the neck lead to degenerative changes in the cervical spine like cervical spondylosis (Mahbub, 2006). In this study the researcher mentioned that most of the participants did not maintain posture during ADL and the Odds ratio was 3.75 and 95% CI was 1.225 and 11.481. That means that, based on the data obtained from the sample, did not maintain sitting posture during ADL had occurred cervical spondylosis incidence that was 3.75 times higher than maintain current posture during ADL.

Rana (2010) state that smoking was a risk factor for cervical spondylosis. Smoking contributor to degenerative disk disease, and was therefore a risk factor for cervical spondylosis (Asher, 2010). In this study the investigator found the relation between cervical spondylosis and smoking. The investigator mention presence of smoking habit in this study because the Odds ratio was 1.289 and 95% CI was 0.479 and 3.469. This means that, based on the data obtained from the sample, presence of smoking habit has occurred cervical spondylosis incidence that is 1.289 times higher than non smoker.

In this study the investigator found the strong relation between cervical spondylosis and poor sleeping posture. The investigator mention poor sleeping posture in this study because the Odds ratio was 18.286 and 95% CI was 2.21 and 151.27. This means that, based on the data obtained from the sample, poor sleeping posture has

occurred cervical spondylosis incidence that is 18.286 times higher than good sleeping posture.

In this study the investigator found the strong relation between cervical spondylosis and poor sitting posture. The investigator mention poor sitting posture in this study because the Odds ratio was 14.5 and 95% CI was 4.066 and 51.709. This means that, based on the data obtained from the sample, poor sitting posture has occurred cervical spondylosis incidence that is 14.5 times higher than good sitting posture.

The investigator mentioned that ergonomically interior design of the office and house was ergonomic structure of tables, chair, computer and other house hold structures in the office and house. He found that the calculated odds ratio was 6.042 that was association between interior design of the office and house and cervical spondylosis that is 6.042 times more possible chance to occur cervical spondylosis due to default interior design of the office and house. The 95% CI was 1.731 and 21.086, means 95% confident that the true ratio in unhealthy interior design of the office and house lies somewhere between 1.731 and 21.086. So the investigator also found relation with default interior design of the office and house and cervical spondylosis.

6.1 Conclusion

In this case control study there was 33 cases and the same number of control that means case: control was 1:1 and conducted in hospital based unmatched setting. The objective of this study to determine the risk factor of cervical spondylosis with considering the factor like socio-demographic and socio-economic variables, current job pattern, posture of ADL, diabetes, habit of smoking, life style, sitting posture, sleeping posture, using number of pillow during sleeping and interior designing of office and house. The investigator found the strong positive association of the cervical spndylosis with posture of ADL, sitting posture, sleeping posture and interior designing of the office and house. The current job pattern, diabetes, smoking habit had found the positive association with the cervical spondylosis. The important way for prevention of cervical spondylosis including the modification lying and sitting posture for reduce risk factors. The investigator suggested careful about the occupational posture during work which might be reduced the risk of cervical spondylosis. Always maintain the correct working position during daily living activities and correct the faulty ergonomics design of the office and house which also reduce the risk of cervical spondylosis. The investigator also found that smoking one of the risk factor of the cervical spondylosis in the study, so should be stopped smoking reduce the risk of the cervical spondylosis. So the investigator wishes to correct the sleeping posture, sitting posture, working environment, interior design of the office and house. The investigator also suggests reducing occupational injuries by modification of the working position and correction the posture during the daily living activities.

6.2 Recommendation

It is crucial to develop research based findings about the risk factors of Cervical spondylosis. This study can be considered as a ground work for the physiotherapy service provision for the cervical spondylosis. Proper physiotherapy can reduce the complication of cervical spondylosis. Like other countries, cervical spodylosis patients are likely to be an upcoming burden for Bangladesh. For this reason, it is important to develop research based evidence of physiotherapy practice in this area. Physiotherapist's practice which is evidence based in all aspect of health care. There are few studies on musculoskeletal area in the cervical region. These cannot cover all aspect of the vast area. So, it is recommended that the next generation of physiotherapy members continue study regarding this area, this may involve-use of large sample size and participants form different districts of Bangladesh. Conduct research on other musculoskeletal problems in cervical spine area where physiotherapist can work. So it is very important to conduct such type research in this area.

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Appendix - 01

সম্মতিপত্র

চিকিৎসা কেন্দ্র:পক্ষাঘাত গ্রন্থদের পুনর্বাসন কেন্দ্র (সি আর পি) সাভার এবং মিরপুর

গবেষণা শিরোনাম “সারভাইকাল স্পনডাইলোসিস রোগের বুকিপূর্ণ বিষয়সমূহ” সম্পর্কিত গবেষণা। গবেষক বাংলাদেশ হেলথ প্রফেশন্স ইন্সটিটিউট (বিএইচপিআই), সিআরপি এর বিএসসি ইন ফিজিওথেরাপি ৪র্থ বর্ষের একজন ছাত্র এবং এই গবেষণা তার অধ্যয়নের একটি অংশ। নিম্নোক্ত তথ্যাদি পাঠ করার পর অধ্যয়নে অংশগ্রহণ করার জন্য আপনাকে অনুরোধ করা হচ্ছে।

এই অধ্যয়নের লক্ষ হল “সারভাইকাল স্পনডাইলোসিস রোগের বুকিপূর্ণ বিষয়সমূহ” খুঁজে বের করা। এই গবেষণার উদ্দেশ্য হল বাংলাদেশে সি আর পি তে সারভাইকাল স্পনডাইলোসিস রোগের বুকিপূর্ণ বিষয়সমূহ খুঁজে বের করা। এটি একটি কেইস-কন্ট্রল স্টাডি এবং এটি রোগীদের জন্য উপকারি।

বাংলাদেশ হেলথ প্রফেশন্স ইন্সটিটিউট, সিআরপি গবেষক কে এই গবেষণা করার অনুমতি প্রদান করেছে। তথ্য সংগ্রহের জন্য গবেষক অংশগ্রহণকারীর কাছ থেকে ২০-৩০ মিনিট সময় নেবেন। অংশগ্রহণকারী যে কোনো মুহূর্তে তার সম্মতি প্রত্যাহার করতে পারেন। এই গবেষণা প্রকল্প হতে প্রাপ্ত সকল তথ্যাদির গোপনীয়তা রক্ষা করা হবে এবং গবেষণার ফলাফল প্রকাশের সময়ে অংশগ্রহণকারীদের কোনো ব্যক্তিগত পরিচয় প্রকাশিত হবে না।

আমি (অংশগ্রহণকারী) উক্ত গবেষণার সকল তথ্যাদি সম্পর্কে বিস্মৃত ভাবে অবগত হয়ে অংশগ্রহণ করার জন্য সম্মতি জ্ঞাপন করছি।

অংশগ্রহণকারীর নাম

অংশগ্রহণকারীর স্বাক্ষর তারিখ

গবেষকের নাম

গবেষকের স্বাক্ষর তারিখ

সহযোগীর (সাক্ষী) নাম

সহযোগীর (সাক্ষী) স্বাক্ষর তারিখ

Appendix - 02

Informed consent

Clinical setting: Centre for Rehabilitation of the paralyzed (CRP) – Savar and Mirpur

The study entitled “Risk factors of cervical spondylosis” is a research project. The researcher is a student of Bangladesh Health Professions Institute (BHPI), CRP in 4th year B.Sc in physiotherapy and it’s a part of his study. The participant is request to participate in study after reading the following information.

The study being conducted on, “Risk factors of cervical spondylosis”. The aim of the research topic is to determinants the risk factors affecting the cervical spondylosis at CRP in Bangladesh. This will be a Case control type of study and will helpful for patients.

For the kind information Bangladesh Health Professions Institute (BHPI), CRP has permitted the researcher to do the research. The conversation time will be 20-30 minutes. The participant reserves the right to refuse the study at anytime. The information obtained from the study would be kept confidential and at the time of publishing the result of the study, personal identification of the participants would not be published.

Ideclare that I am giving my consent to participating in the study after being informed about all the information in details.

Name of the Interviewer.....

Signature of the Interviewer..... Date.....

Name of the Investigator.....

Signature of the Investigator..... Date.....

Name of the Care giver (Witness).....

Signature of the Care giver (Witness)..... Date.....

Appendix - 03

প্রশ্নাবলী

বিষয়: সারভাইকেল স্পনডাইলোসিস রোগের বুকিপূর্ণ বিষয় সমূহ।

অংশ-০১: রোগীর পরিচিতি	
১.১	সনাক্তকরণ নং-
১.২	অংশগ্রহনকারীর নাম-
১.৩	ঠিকানা:
১.৪	সাক্ষাতের তারিখ:
১.৫	সম্মতি গ্রহন: <input type="checkbox"/> হ্যা <input type="checkbox"/> না

অংশ-০২: রোগীর আর্থসামাজিক অবস্থার তথ্যাবলী

প্র নং	প্রশ্নাবলি	উত্তর	কোড
২.১	বয়স	বছর	
২.২	লিঙ্গ	পুরুষ	০১
		মহিলা	০২
২.৩	ওজন	কেজি	
২.৪	আপনার বৈবাহিক অবস্থা কি?	বিবাহিত	০১
		অবিবাহিত	০২
		তালাকপ্রাপ্ত	০৩
		আলাদা	০৪
		বিধবা	০৫
		বিপত্তিক	০৬
২.৫	আপনার ধর্ম কি?	ইসলাম	০১
		হিন্দু	০২
		খ্রিস্টান	০৩
		বৌদ্ধ	০৪
২.৬	আপনার শিক্ষাগত যোগ্যতা কি?	কখনো স্কুলে যাইনি	০১
		কিছু প্রাথমিক শিক্ষা	০২
		প্রাথমিক শিক্ষা সম্পন্ন করেছি	০৩
		কিছু মাধ্যমিক শিক্ষা	০৪
		মাধ্যমিক শিক্ষা সম্পন্ন করেছি	০৫
		উচ্চমাধ্যমিক শিক্ষা	০৬
		পাঠক/পাঠকগুরু	০৭
		অন্যান্য (উল্লেখ করুন)	৯৯
২.৭	আপনার পেশা কি?	রিম্বাচালক	০১
		চাকুরিজীবী	০২
		কৃষক	০৩
		গাড়ীচালক	০৪
		ব্যবসায়ী	০৫
		দিনমজুর	০৬
		গৃহিনী	০৭
		শিক্ষক	০৮

		ছাত্র	০৯
		ডাক্তার	১০
		ফিজিওথেরাপিস্ট	১১
		অন্যান্য (উল্লেখ করুন):	৯৯
২.৮	আপনার পরিবারের মাসিক আয় কত?		টাকা
২.৯	আপনার প্রিয় সখ কি?	বাগান করা	০১
		বই পড়া	০২
		লেখালেখি	০৩
		খেলাধুলা	০৪
		টিভি দেখা	০৫
		মাছ ধরা	০৬
		ঘোড়ায় চড়া	০৭
		অন্যান্য (উল্লেখ করুন):	৯৯

অংশ-০৩: রোগীর শারিরিক কর্মকান্ড বিষয়ক

প্র নং	প্রশ্নাবলি	উত্তর	কোড
৩.১	আপনি কি ঘাড়ে কোন আঘাত পেয়েছিলেন?	না	০১
		হ্যাঁ	০২
৩.২	আপনার ঘাড়ে কি কোন অস্ত্রপচার হয়েছিল?	না	০১
		হ্যাঁ	০২
৩.৩	আপনার বর্তমান চাকুরির অবস্থা কি?	শারিরিক এবং মানসিক চাপযুক্ত কাজ	০১
		সুস্বাস্থ্য ও বন্ধুত্বপূর্ণ পরিবেশ	০২
৩.৪	আপনার দৈনন্দিন কর্মকান্ড করার সময় শারিরিক কাঠামো ঠিক রাখেন কিনা?	ঠিক রাখি না	০১
		শারিরিক কাঠামো ঠিক রাখি	০২

অংশ-০৪: জীবনজীবিকা ও ব্যবহার বিষয়ক

প্র নং	প্রশ্নাবলি	উত্তর	কোড
৪.১	আপনার কি বহুমুত্র রোগ বা ডায়াবেটিস আছে?	হ্যাঁ	০১
		না	০২

৪.২	আপনি কি নেশাগ্রস্ত?	না	০১
		হ্যা	০২
৪.৩	আপনি কি ধূমপান করেন?	হ্যা	০১
		না	০২
৪.৪	আপনার জীবন-জীবিকা কি রকম?	অস্বাস্থ্যকর জীবিকা	০১
		সাধারণ জীবিকা	০২

অংশ-০৫: শারিরিক অবস্থার ধরন

প্র নং	প্রশ্নাবলি	উত্তর	কোড
৫.১	আপনার বসার ধরন কেমন?	অস্বাভাবিক	০১
		স্বাভাবিক	০২
৫.২	আপনার দাড়ানোর ধরন কেমন?	অস্বাভাবিক	০১
		স্বাভাবিক	০২
৫.৩	আপনার ঘুমানোর ধরন কেমন?	অস্বাভাবিক	০১
		স্বাভাবিক	০২
৫.৪	আপনি ঘুমানোর সময় কয়টি বালিশ ব্যবহার করেন?	বালিশ ব্যবহার করিনা	০১
		১টা বালিশ	০২
		২টা বালিশ	০৩

অংশ-০৬: জৈব প্রযুক্তি এবং কাঠামোগত বিষয়ক

প্র নং	প্রশ্নাবলি	উত্তর	কোড
৬.১	আপনার শরীরবৃত্তীয় গঠন কি রকম?	অসুগঠিত দেহ	০১
		অসুগঠিত দেহ	০২
৬.২	আপনার অফিসের অভ্যন্তরীণ সজ্জা কি রকম?	অসঠিক সজ্জা	০১
		সঠিক সজ্জা	০২
৬.৩	আপনার গৃহের অভ্যন্তরীণ সজ্জা কি রকম?	অসঠিক সজ্জা	০১
		সঠিক সজ্জা	০২

অংশ-০৭ঃ খেলাধুলা

প্র নং	প্রশ্নাবলি	উত্তর	কোড
৭.১	আপনি কি খেলাধুলা করেন?	খেলাধুলা করেন না	০১
		খেলাধুলা করেন	০২

Appendix - 04

Questionnaire

Title: Risk factors of cervical spondylosis

Part-1: Patient's Identification	
1.1	Identification Number:
1.2	Name of respondents:
1.3	Address:
1.4	Date of interview:
1.5	Consent Taken: <input type="checkbox"/> Yes <input type="checkbox"/> No

Part 2: Patient's Socio-demographic Information

QN	Questions and filters	Response	Code
2.1	Age (in year)	Years	
2.2	Sex:	Male.....	01
		Female.....	02
2.3	Body weight	KG	
2.4	What is your marital status?	Married.....	01
		Unmarried.....	02
		Divorced.....	03
		Separated.....	04
		Widow.....	05
		Widower.....	06
2.5	What is your religion?	Islam	01
		Hinduism.....	02
		Christian.....	03
		Buddha.....	04
2.6	What is your educational status?	Never attended school	01
		Some primary education	02
		Completed primary education	03
		Some secondary education	04
		Completed secondary education..	05
		Higher secondary	06
		Bachelor or above	07
		Other (Specify):	99
2.7	What is your profession (occupation)?	Rickshaw puller	01
		Service holder.....	02
		Farmer	03
		Driver.....	04
		Businessman.....	05
		Day laborer.....	06
		Housewife	07
		Teacher	08

		Student.....	09
		Doctor.....	10
		Physiotherapist	11
		Other (Specify):	99
2.8	What is the average monthly income of your household?	(Taka)	
2.9	What is your favorite hobby?	Gardening.....	01
		Reading.....	02
		Writing	03
		Playing	04
		Watching television	05
		Fishing	06
		Horse riding.....	07
		Stamp & coin collection.....	08
		Other	99

Part 3: Pattern of physical activities

QN	Questions and filters	Response	Code
3.1	Have you any trauma in the cervical?	No	01
		Yes.....	02
3.2	Have you any cervical spine surgery?	No	01
		Yes.....	02
3.3	What is your current job pattern?	Physical & mentally stressful job.....	01
		Healthy friendly environment.....	02
3.4	Activity of daily living (ADL) of you?	Do not maintain posture.....	01
		Maintain correct posture during ADL	02

Part 4: Behavior & life style

QN	Questions and filters	Response	Code
4.1	Do you have Diabetes?	Yes.....	01
		No	02

4.2	Substance abuse	No.....	01
		Yes.....	02
4.3	Smoking	Yes.....	01
		No.....	02
4.4	Life style	Unhealthy life style.....	01
		Normal life.....	02

Part 5: Posture

QN	Questions and filters	Response	Code
5.1	Sitting posture	Poor	01
		Good	02
5.2	Standing posture	Poor	01
		Good	02
5.3	Sleeping posture	Poor	01
		Good	02
5.4	Using pillow during sleep	No pillow.....	01
		One pillow.....	02
		Two pillow.....	03

Part 6: Biomechanical & Agronomical factors

QN	Questions and filters	Response	Code
6.1	Anatomical texture of the body	Poor alignment of body.....	01
		Good alignment of body.....	02
6.2	Interior designing of office	Default design.....	01
		Proper agronomical design.....	02
6.3	Interior designing of house	Default design.....	01
		Proper agronomical design.....	02

Part 7: Sports

QN	Questions and filters	Response	Code
7.1	Sports	No playing.....	01
		Used to play.....	02

Appendix - 05

Timeline of the Study

Activities	March 2011	April 2011	May 2011	June 2011	July 2011	February 2012
Selection of Topic						
Literature Review						
Selection of Study Area						
Methodology						
Data Collection						
Compiling and Analysis						
Report Writing and Submission						

Appendix-06

PERMISSION LETTER

To
The Head of the Department,
Physiotherapy Department,
Center for the Rehabilitation of the Paralyzed (CRP)
Savar, Dhaka-1343

Subject: Permission to collect data to conduct a research study.

Sir,
I respectfully to state that I am a student of 4th year B.Sc in physiotherapy at Bangladesh Health Professions Institute(B.H.P.I).In 4th year we have to do a research project and I have chosen a title that is "Risk Factors of Cervical Spondylosis". I have chosen the physiotherapy department of CRP in Saver and Mirpur for data collection. For your kind information the research methodology, consent form & questionnaire have submitted with this application.

I therefore pray and hope that you would be kind enough to give me permission to do this study successfully in your department.

Yours faithfully

Mahmudul Hasan Imran
Mahmudul Hasan Imran
4th year B.Sc in physiotherapy of B.H.P.I.
CRP, Savar,Dhaka

Date: 09/10/2011

*Given permission for
data collection at CRP-Savar
and CRP-Mirpur.*

09/10/2011
Mohammad Anwar Hossain
Assistant Professor &
Acting Head of Physiotherapy Dept
CRP Chittagong Saver-1343