Factors Associated with Neck Pain among the Selected Population (Lawyers)

SHANTONU MALLIK
MPH(Epidemiology)
ASA University of Bangladesh

Abstract:

Purpose: *To find out what are the factors associated with neck pain among the selected population (Lawyers) in a selected area of Dhaka City.* **Objectives**: *To find out the factors associated with neck pain among the selected population (lawyers) in a selected area of Dhaka city, Bangladesh, to find out the male female ratio of neck pain, to find out the most affected age group of neck pain, to identify the risk factors of neck pain among the lawyers in court.* **Methodology**: *The study design was cross sectional. Total 128 samples were selected by purposive sampling from the Supreme Court, Dhaka. Data was collected by mixed type self administered questionnaire. Descriptive statistics were used for data analysis which focused Table (mead, Standard deviation), histogram, pie chart and bar chart.* **Result**: *The factors association shows that about 91.41 % participants have pain on neck last 12 months. Through working experience neck pain increase the common years are 5-10 years and involvement is 31.25 %. Also association neck pain with physical exertion 75 % (occasional) In case of dress up duration there is strong association among 5 to 8 or more hours 75 % and psychological stress during work 78.12 % among the participants.* **Conclusion**: *The findings of this study suggest that neck pain is common among lawyers in the Supreme Court, Dhaka, Bangladesh and this may be associated with the professional experience, physical or mental exertion, dress-up and the psychological stress factors.*

Key words: Neck pain, Factors, VAS, Lawyers, Court, Physical & Mental exertion, Psychological stress.

INTRODUCTION

Neck pain is one of the most common causes of musculoskeletal disorders related to work status and condition. Donald R. Gore, MD, Medical College of Wisconsin, pain is a common Milwaukee, neck problem in our society and, at any given time, affects about 10% of the general population. The Pan American Health Organization with WHO identified neck pain as one of the occupational health problems in the Americans. Health care is most important sector of every country. Neck pain is one of the common musculoskeletal disorders in both men and women (Schlossberg et al 2004). Pain that present in the neck region with or without referred up to upper limb defined as neck pain. Work-related musculoskeletal disorders are common and increasing in the United States (Bureau of labor 1993), between 1982 and 1992, the reported number of musculoskeletal disorders of the upper extremity has steadily increased, accounting e estimated to exceed $20 billion annually (Webster and Snook-1994).n for these disorders all disorders are responsible for growing costs as evidenced by increases in worker's compensation coast, as well as escalating costs of diagnosis and treatment. Total compensable costs to the nation 1992 for more than 60% of all occupational illness(Bureau of labor motion and weakness in the job, these disorders may cause pain, restricted motion and weakness in the hands, arms, shoulders, neck, back and lower limbs .coupled with the human cost in suffering and lost wages, work related musculoskeletal It is caused due to various factors such as degeneration, trauma and mechanical causes and a variety of occupational factors such as prolonged sitting, standing, lifting, bending and heavy manual work, optics users, emotional stress, long time desk

work and faulty postures. Neck pain is common. About 2 in 3 people develop a bout of neck pain at some time in their lives. One survey done in the UK found that, of adults aged 45-75 years, about 1 in 4 women and about 1 in 5 men had current neck pain.

Palmer et al. investigated the prevalence of neck pain and its association with occupational activities, at a population leveling England, Scotland and Wales, and observed that neck pains were more associated with headaches and stress than with the occupational activity.

Work related musculoskeletal disorders can result in direct cost, such compensation and medical expenditure, as well as direct costs such as disruption in productivity and quality, worker replacement costs, training and absence costs. it has become a major concern because of the negative impact on the health and productivity of employees and is therefore a significant problem for employers and workers(professionals) to pay attention to (Putz-Anderson 1988).

Literature has shown that man employed in heavy manual jobs have a higher incidence of neck pain and a higher rate of absenteeism than sedentary workers. Sedentary workers involve people working in banks, shops, travel agencies, post-offices or any other office jobs who maintain a static sitting position for a long time. Some studies have indicated that workers with jobs that require prolonged sitting have an increased risk of neck and low back pain. Functions of the upper back or neck region include structural support, movement, and protection of certain body tissues. Pain in the neck can relate to the bony cervical spine, discs between the vertebrae, ligaments around the spine and discs, spinal cord and nerves, muscles of the neck region, carotid artery, and the skin covering the neck.

Mechanical neck and back pain implies the source of pain is in the spine and/or its supporting structure. This occurs when one of the joints in the spine loses its normal joint play

(resiliency and shock absorption). Treatment of Neck pain is optimally directed toward a diagnosed or suspected specific cause. For acute neck pain, use of a home remedy or rest initially can be beneficial. The first step to understanding neck pain is appreciating the normal design (anatomy) of the tissues of this area of the body. Continuous forward bending can lead to neck muscle discomfort and the changing the curvature of the neck, because the around the neck the muscle are too short to do prolong activity against gravity. Those who are involving in advocacy profession they have to work on desk for a long period of time, they have to write or filling the case on table for longer period. They use very congested space for doing chamber in the Supreme Court region. They have to argued in front of the Judge for a prolong time, they are always well dressed with ties .so very tight fitting of the daily court and dress make them very discomfort and tired .although they have to work though their mental stress, so with optical use and the strenuous job they are mainly getting the neck pain in their common work place may be due to faulty chair table setup."One would have thought by now that the problem of diagnosis and treatment would have been solved, but the issue remains mysterious and clouded with uncertainty." (Rosomoff HL, Rosomoff RS.1999).

Research suggest that increased neck and shoulder flexion increases the biomechanical load on surrounding body structures which lead to pain, discomfort, ache and developing musculoskeletal disorders(McPhee1990).

METHODOLOGY

Cross-sectional study design has used to identify the factors association with neck pain among the lawyers in selected area of Dhaka city, Bangladesh. People were selected at a point in time without follow-up. This study was provided base line information and further research hypothesis was developed from the finding of this study. This is a survey on factors

association with neck pain among the lawyers in the selected area of Dhaka city. The study site is selected the Supreme Court premises of Dhaka, Bangladesh. Sample will be selected according to the inclusion criteria. The study was conducted for a period from April to September 2014.Those people are engaged in Advocacy profession(Lawyer), are practicing regularly and those have experienced neck pain recently without other pathology or contributing factors which are not related to other then the Mechanical neck pain. I have taken data from among the lawyer in the Supreme Court area in Dhaka city who were interested to being a part of this study and those who have neck pain and age between 30-60 years. Through a purposive sampling technique was fallowing or employed to select the sample. n=128 participants were selected through random sampling technique from the Supreme Court. Who were willing to participate in face to face questioner session and asked to participate in the study. I developed self-administered structured questionnaire after studying or re-viewing literature and used visual analogue scale (VAS) to find out the pain level. On the basis of the inclusion and exclusion criteria questions were asked. In the questioner participants demographic information including age, sex, marital status, level of education, work experience, duration of work and relation to sitting, dress fitting and tie/band fitting, mental satisfaction and the working environments related data were collected. Quantitative data was analyzed by using SPSS-16 software. Descriptive statistics were used for data analysis. Data were numerically coded and captured in SPSS-16.0 version software program for analyze the data as descriptive statistics. I collected the descriptive data and calculated as descriptive statistics as percentages and presented by using both histograms, bar and pie charts.

For conducting this study ethics committee were checked the proposal and allowed to carry out the research project. The formal permission was taken from the Register of

the Supreme Court to collect the data. Data collection was started and completed within the allocate time frame. All the data were review in strict secure and maintained confidentiality. The assessment file was strictly secured and it was not opened in front others without researcher.

RESULTS

Socio-demographic characteristics:

Distribution of the respondents by Age

Among the total respondents (n=128), 18% were included between the age ranges of 40-50 years. Their mean and SD were 45 years (±6.689) respectively.
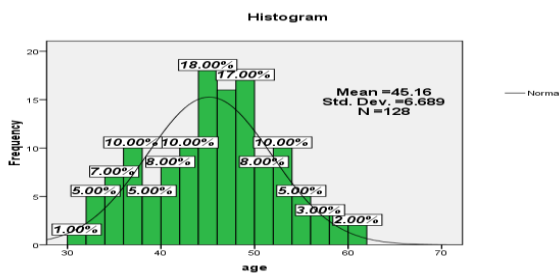

Figure -1- Distribution of the respondents by Age.

Distribution of the respondents by Sex:

Among the total study population (n=128) majority of the respondents were male, where the male and female proportion were 75% (n=96) and 25% (n=32) accordingly.

Table-1. Distribution of the respondents by Sex:

Characteristics	No	Percentage (%)
Male	96	75.0
Female	32	25.0
Total	128	100

Distribution of the respondents by Religion:

Among the total study population (n=128) majority of the respondents were 85.2.0 % (n=109) Islam, 13.3 % (n=17) Hindu and 1.6 % (n=2) Christian accordingly.

Table-2 Distribution of the respondents by Religion:

Characteristics	No	Percentage (%)
Islam	109	85.2
Hindu	17	13.3
Christian	2	1.6
Total	128	100.0

Distribution of the respondents by Marital status

Among the total study population 128.mejority of participant's are 94.5. % (n=121) Married, 3.9 % (n=5) Unmarried and 1.6 % (n=2) Divorce respectably.

Table-3 Distribution of the respondents by Marital status:

Characteristics	No	Percentage (%)
Married	121	94.5
Unmarried	5	3.9
Divorced	2	1.6
Total	128	100.0

Distribution of the respondents by Professional Experience-

This bar diagram shows the professional experience among the Lawyers in the court. Here majority percentage of experience is 31.25 % (n=40) participants are 5-10 years experience. 24.22 % (n=31) participants, 23.44 % (n=30) participants 18.75 % (n=24) participants and 2.34 % (n=3) participants.
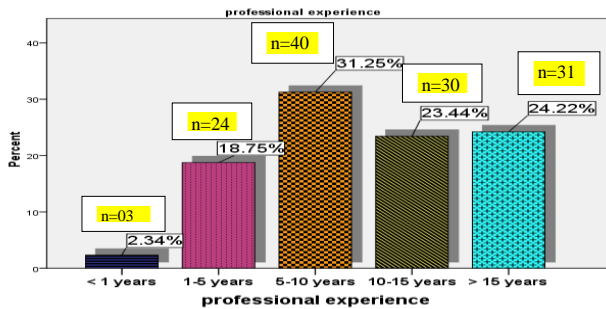
Figure-2 Distribution of the respondents by professional Experience

Distribution of the respondents by Knowledge about Neck pain

Among the Study population 128, only 44.53% (n=57) participants have the knowledge about the neck pain others 55.47 % (n=71) participants do not have the knowledge. Here the pie chart shows the knowledge level of the participant about the neck pain.
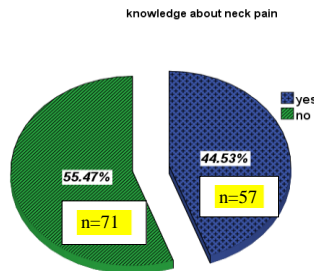

Figure-3 Distribution of the respondents by Knowledge about Neck pain

Distribution of the respondents by Pain or discomfort during last year or 12 months

Here the bar diagram shows 91.41% (n=117)   participants have pain on last 12 months and 8.59% (n=11) participants do not feel pain or discomfort last year.
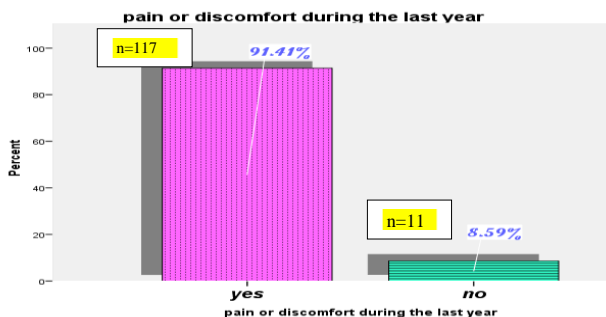
Figure-4-Distribution of the respondents by Pain or discomfort during last year.

Distribution of the respondents by Visual Analogue Scale

Among the study population 128, this bar diagram shows 53.91 %(n=69) pain is mainly Mild pain (VAS-1-3).35.16 % (n=45) pain is moderate pain (VAS-4-7), 8.59% (n=11) pain is severe pain (VAS-8-10) and only 2.34 % (n=03). pain is no pain. (VAS-0)
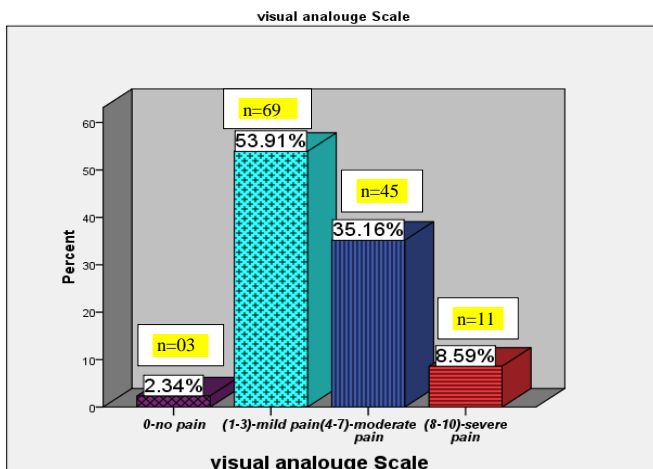

Figure-5- Distribution of the respondents by Visual analogue Scale.

Distribution of the respondents by Factors contributed to neck pain:

Among the study population 128, this pie diagram shows 36.72% (n=47) neck pain is related to working in awkward or cramped position.35.16% (n=45) neck pain is related to bend or twist neck in an awkward way.12.50% (n=16) neck pain is related to position for long time standing, bend over sitting.10.16% (n=13) pain is related to perform the same task over and over.5.47% (n=7) cases are related to performing manual work.
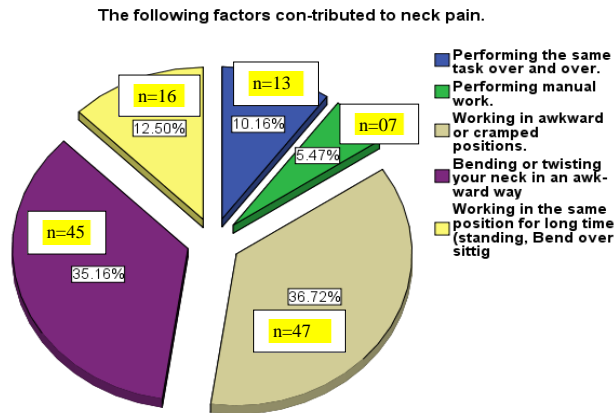
The following factors con-tributed to neck pain.

- Performing the same task over and over.
- Performing manual work.
- Working in awkward or cramped positions.
- Bending or twisting your neck in an awkward way
- Working in the same position for long time (standing, Bend over sittig

Figure-6- Distribution of the respondents by Factors contributed to neck pain.

Distribution of the respondents by work disturbance due to pain.-

Among the study population 128, here the table shows about 75% (n=96) participants have disturbed in work due to neck pain and only 25 % (n=32) participants do not have that.

	Frequency	Percentage (%)
Yes	96	75.0
No	32	25.0
Total	128	100.0

Tabel-4- Distribution of the respondents by work disturbance due to pain.

Distribution of the respondents by their leisure disturbance due to pain

Here the table shows among the study population 128, about-61.72% (n=79) participants says they have leisure problem during neck pain and about 38.28 % (n=49) participant do not have leisure problem during neck pain.

Table-5- Distribution of the respondents by their leisure disturbance due to pain

	Frequency	Percentage (%)
Yes	79	61.72
No	49	38.28
Total	128	100.0

Distribution of the respondents by Types of treatments-

Here this bar diagram shows among the study population 128, about 54.33% (n=69) participants getting medicine for pain, 42.73% (n=53) participants getting physiotherapy and rest of 3.94% (n=6) participants have taken others treatment facilities.
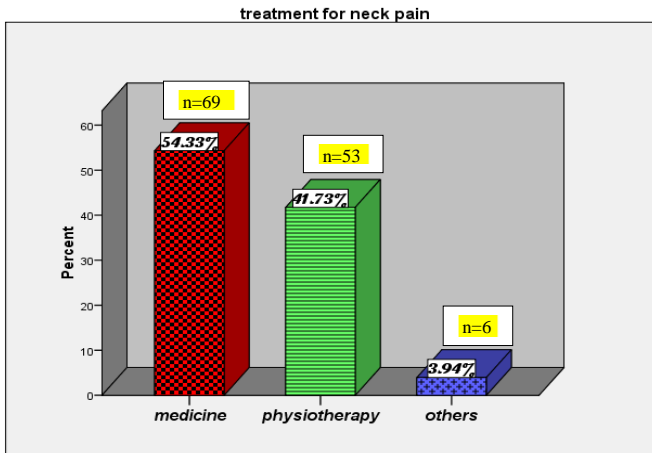
Figure-7 - Distribution of the respondents by Types of treatments

Distribution of the respondents by Type of chair use:

This bar diagram shows the type of chair use is common among the lawyers (n=128) in the court.42.19% (n=54) -wooden, 24.22% (n=31) -revolving chair, 17.97% (n=23) not adjusted, 14.84% (n=19) -adjusted and 0.78% (n=1) others type.
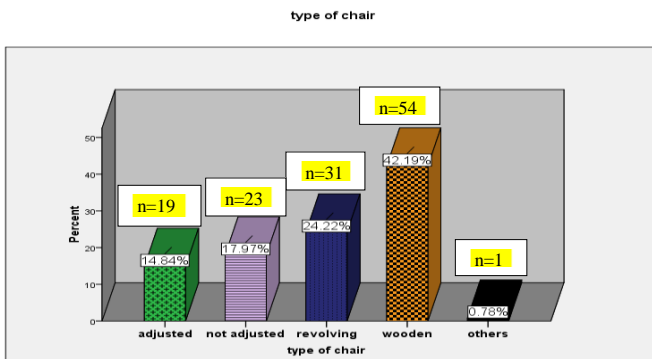

Figure-8- Distribution of the respondents by Type of chair use.

Distribution of the respondents by Duration of chair use.

This bar diagram shows the duration of chair use is common among the lawyers (n=128) in the court.44.53 %(n=57) participants use 5 to 8 hours, 29.69 % (n=38) participants use >

8 hours, 21.88% (n=28) participants use 3 to 5 hours.3.91% (n=5) participants use <3 hours.
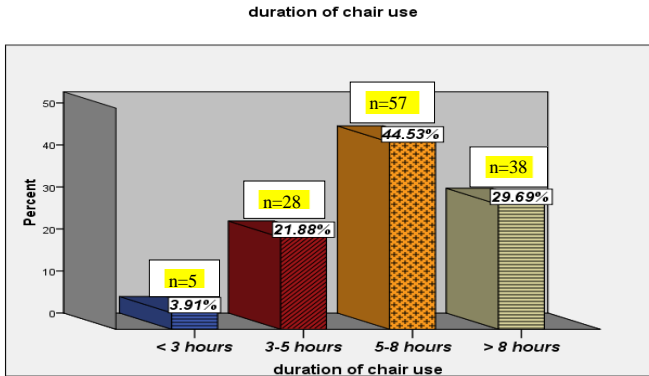

Figure-9- Distribution of the respondents by Duration of chair use.

Distribution of the respondents by Duration of Dress -Up

This bar diagram shows the most common duration of dress-Up among the lawyers (n=128) in the court, 46.88 % (n=60) participants dressed 5 to 8 hours, 28.12% (n=36) participants dressed >8 hours, 23.44% (n-30) participants dressed 3 to 5 hours and 1.56 % (n=2) participants dressed <3 hours.
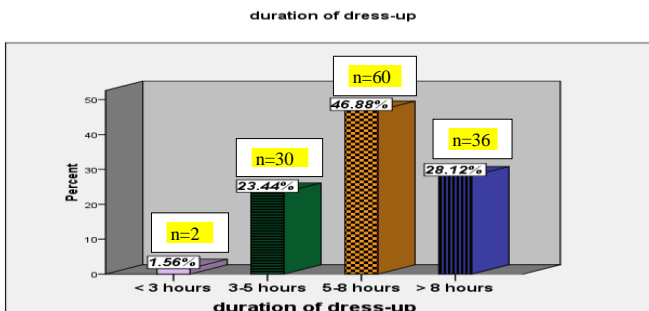

Figure-10- Distribution of the respondents by Duration of Dress -Up

Distribution of the respondents by Duration of tie/band use

This bar diagram shows the most common duration of tie/band use among the lawyers in the court.47.66 % 5 to 8 hours (n=61),

25.00% - >8 hours (n=32), 24.22%, 3 to 5 hours (n=31) and 3.12% <3 hours (n=4)

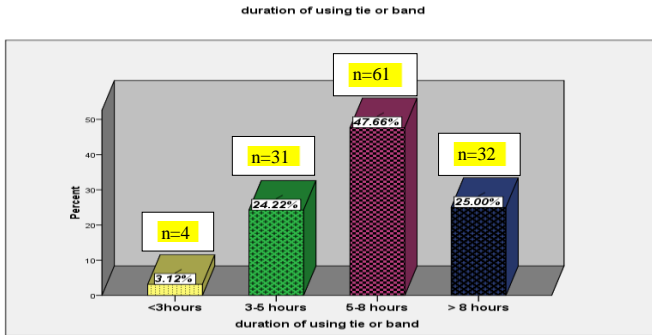**Figure-11- Distribution of the respondents by Duration of tie/band use.**

Distribution of the respondents by Social support

This Pie chart shows that among the sample population (n=128) 65.62% (n=84) participants social support is satisfactory.31.25% (n=40) participants social support good and only 3.12% (n=4) participant's social support is bad.
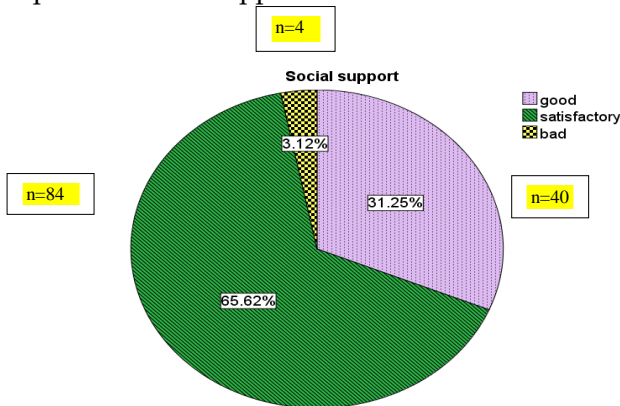

Figure-12- Distribution of the respondents by social support

Association between Visual analogue Scale & professional experience

Analysis showed that n=72 participants out of n=128 participants who have mild pain on Visual analysis scale. n= 56 participants have severe pain. Among them n=67 participants have <1 to 10 years experience and n= 61 participants have 10> years experience. There is close significant relationship between visual analogue scales with professional experiences because x^2 = 22.526 and < **p** = 0.05.

Table-6- Association between Visual analogue Scale & professional experience

	Professional Experience			x^2test	df	P value
VAS		<1 to 10 years	10 > years	22.526[a]	12	0.032
	0 to 3-Mild pain	48	24			
	4 to 10- Severe pain	19	37			

Association between Visual analogue Scale & physical exertion

Analysis showed that n=72 participants out of n=128 participants who have mild pain on Visual analysis scale. n=56 participants have severe pain. Among them n=96 participants have occasional physical exertion and n=32 participants have often physical exertion. There is close significant relationship between visual analogue scales with physical exertion because x^2= 41.674and < **p** = 0.05.

Table-7-Association between Visual analogue Scale & physical exertion.

	Physical exertion			x^2test	df	P value
VAS		Occasional	Often	41.674[a]	6	0.032
	0 to 3-Mild pain	55	17			
	4 to 10- Severe pain	41	15			

Association between visual analogue scale & factors of neck pain

Analysis showed that n=72 participants out of n=128 participants who have mild pain on Visual analysis scale. n=56 participants have severe pain. Among them n= 67 participants performing same work in awkward position and n= 61participants performing neck twisting and long time walking position. There is no significant relationship between visual analogue scales with table's factors because χ^2= 15.847 and > **p**= 0.05.

Table-8- Association between visual analogue scale& factors of neck pain

	Factors of neck pain		χ^2test	df	P value
		Performing same work in awkward position	Performing neck twisting and long time walking position	15.847a	12	0.198
VAS	0 to 3-Mild pain	45	27			
	4 to 10- Severe pain	22	34			

Association between VAS & Duration of Dress-Up

Analysis showed that n=72 participants out of n=128 participants who have mild pain on Visual analysis scale. n=56 participants have severe pain. Among them n=32 participants dress-up for < 3 to 5 hours and n=96 participants dress-up for 5 to 8 > hours. There is significant relationship between visual analogue scales with duration of dress -up because χ^2= **24.351** and **< p = 0.05**.

Table-9- Association between VAS & Duration of Dress-Up.

	Duration of Dress-Up		χ^2test	df	P value
		<3to 5 hours	5 to 8> hours	24.351a	9	.004
VAS	0 to 3-Mild pain	24	48			
	4 to 10- Severe pain	8	48			

Association between Visual Analogue Scale & Psychological stress

Analysis showed that n=72 participants out of n=128 participants who have mild pain on Visual analysis scale. n=56 participants have severe pain. Among them n=100 participants have psychological stress for working environment and n=28 participants have psychological stress for working environment. There is significant relationship between visual analogue scales with psychological stress for working environment because χ^2= **14.404** and **< p = 0.05**.

Table -10- Association between Visual Analogue Scale & Psychological stress

	Psychological stress			χ^2test	df	P value
		yes	no			
VAS	0 to 3-mild pain	51	21	14.404ᵃ	3	.002
	4 to 10- Severe pain	49	7			

DISCUSSION

This study examined the factors of neck pain among the lawyers in Court of Dhaka city. This study found that among the total sample population is n =128.Among them age histogram shows the age limit is 30 to 60 which indicating the mechanical pain age. 45 to 50 years age percentage is more (18 %).The neck pain increase with age and also with the professional experience. This result is comparable to Bernard's et al, 2006.

Sex Mean (SD) 1.25 (± 0.435) most are male then female,

Religion Mean (SD) 1.16(±0.412)-here most people are Muslim.

Marriage Mean (SD) 1.07(±0.312)-most people are married.

Professional experience is indicating the increase in experience, the increase in neck pain. Here most common percentage of

experience is 31.25 % (n=40) 5-10 years experience. 24.22 % (n=31) more than 15 years and 23.44% (n=30) 10-15 years experience. This result indicating the Côté, 2012; and Leboeuf-Yde- 2004, findings which adding the personal risk factors (e.g. age, gender, experience) that related to neck pain. Association between Visual analogue Scale (VAS) & professional experience show n=72 participants out of n=128 participants who have mild pain on VAS. n=56 participants have severe pain. Among them n=67 participants have <1 to 10 years experience and n=61 participants have >10 years experience. There is close significant relationship between visual analogue scales with professional experiences because χ^2 = 22.526 and < p = 0.05.

In the study only 44.53% (n=57) participants have the knowledge about the neck pain on the other hands 55.47 % (n=71) participants do not have the knowledge about neck pain. The participants do not have proper knowledge about the neck pain.

In the study 91.41% (n=117) participants have pain on last 12 months and only 8.59% (n=11) participants do not feel pain or discomfort last year. This result is comparable to Hogg-Johnson S, van der Velde G, Carroll L, Holm L, Cassidy D, Guzman J, Côté P, Carragee E, Hurwitz E, Nordin M, *Spine,* 2008: vol. 33, no. 45, pp. S39-S51 study.

Among the study population (n=128), In Visual Analogue Scale(VAS)-shows participants have 53.91% (n=69) pain is mainly Mild pain (VAS-1-3).35.16% (n=45) pain is moderate pain (VAS-4-7), 8.59% (n=11) pain is severe pain (VAS-8-10) and only 2.34% (n=03) pain is no pain. (VAS-0).

Among the participants (n= 128), According to some defined factors 36.72%(n=47) neck pain is related to work in awkward or cramped position.35.16% (n=45) neck pain is related to bend or twist neck in an awkward way.12.50% (n=16)neck pain is related to position for long time standing, bend over sitting.10.16% (n=13) pain is related to perform the same task over and over.5.47% (n=7)cases are related to

performing manual work. This study related to Côté et al., 2008; Palmer & Smedley,2007; van Rijn et al., 2010 and P. CoenenI. KingmaC.R. BootM. DouwesP.M. BongersJ.H. van Dieën Ergonomics, 2012, 55(11):1373-1381.) Study on '*the repetitive handling, extreme body postures (e.g. upper arm flexion and neck flexion), high forces or a combination of these factors are associated with neck and shoulder pain.*' Association between visual analogue scale (VAS) & factors of neck pain show (n=67) participants performing same works in awkward position and n=61participants perform neck twisting and long time walking position. There is no significant relationship between visual analogue scales with table's factors because χ^2= 15.847 and > p = 0.05 (p= 0.198) and also the sample size is small, in case of large sample size it can be measured or find out the more satisfactory result.

Due to neck pain, 75% (n=96) participants have disturbed in work and only 25 % (n=32) participants do not have that 61.72% (n=79) participants says they have leisure problem during neck pain and about 38.28 % (n=49) participant do not have leisure problem during neck pain.. This result is comparable to J H Andersen, A Kaergaard, S Mikkelsen, U F Jensen, P Frost, J P Bonde, N Fallentin,J F Thomsen-Occup Environ Med 2003;60:649–654) study. Associations between Visual analogue Scale (VAS) & physical exertion show n= 96 participants have occasional physical exertion and (n=32) participants have often physical exertion. There is close significant relationship between visual analogue scales with occasional physical exertion because χ^2= 41.674and < p = 0.05.

Duration of duration of dress-Up among the lawyers in the court.46.88 %(n=60) -5 to 8 hours, 28.12% (n=36) ->8 hours, 23.44% (n=30) -3 to 5 hours and 1.56 % (n=02) <3 hours. Many of them are used 5 to 8 hours of dress up, which included tight tie or band use and have close association whit the neck pain among the participants'. Association between VAS & Duration of Dress-Up show (n= 32) participants dress-up for < 3 to 5

hours and (n=96) participants dress-up for 5 to 8 > hours. There is significant relationship between visual analogue scales with duration of dress -up because χ^2= 24.351 and < p = 0.05.they are using tight and well fitted goun for long time, that may causes neck pain among them ,study show there is good association of this factor.

Visual Analogue Scale & Psychological stress for working environment show (n= 100) participants have psychological stress for working environment and (n=28) participants do not have psychological stress for working environment. There is significant relationship between visual analogue scales with Psychological stress for working environment because χ^2= 14.404 and < p = 0.05.This study is comparable to Farideh Sadeghian, Mehdi Raei, Georgia Ntani, David Coggon mail, (Published: February 28, 2013) , J H Andersen, A Kaergaard, S Mikkelsen, U F Jensen, P Frost, J P Bonde, N Fallentin,J F Thomsen-(Occup Environ Med 2003;60:649–654) and Harcombe H[1], McBride D, Derrett S, Gray A.-(Inj Prev. 2010)'s studies.

CONCLUSION

The findings of this study suggested that neck pain was common among lawyers in the Supreme Court, Dhaka, Bangladesh. In this study had found 30 to 60 years are commonly associated with mechanical neck pain. The results showed that about 91.41 % (n=117) participants had neck pain during last year or 12 months. Neck pain was associated with the professional experience where 31.25% (n=70)5 to 10 years experience, physical exertion 75% (n=72) of the participants present , duration of dress-up common 75% (n=72)of participants 5 to 8> hours and the psychological stress factors presented about 78.1% (n=100) of participants. .Numbers of factors are related to neck pain and have great impact causing severe long term pain, physical disability and give rise to huge

costs for the society. It is important to develop research and evidence based study in this Area. There are no or rare studies on Lawyer's neck pain. These cannot cover all aspect of the vast area. Only professional experience, physical and mental exertion, dress-up and psychological stress have found association on neck pain among the lawyer in the Supreme Court in Dhaka city. Others important factors may not found any association, like some defining factors, duration on chair use and room environment. The large sample size can bring fruitful assumption about the association. So the next generation of MPH student should continue study regarding this area which will include large sample size and participants form different Court area of Bangladesh. Conduct study on other medical related problems among the lawyers will be possible.

RECOMMENDATION

This study shows that the professional experience, physical, dress up and psychological stress factors have good association with neck pain.

- They should avoid long time desk work. They have to take rest every 30 hours.
- They should avoid physical exertion by taking proper rest and exercise.
- They have to avoid tight fitting dress code (e.g.-tie/band/guan).
- They have to maintain proper sitting posture and free space in their working area.
- They should avoid psychological stress through self actualization.
- They have to get knowledge about their problem and take proper treatment.

REFERENCES

1. Acute Neck pain, 2004- Acute neck pain, 2004. *National health and medical research council,* August 2011.http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/ p94c.pdf *or rcc-uk.org / RCC-QS-Neck-Pain... /p1-64.pdf.*

2. Bureau of Labor Statistics, 2003. Lost-work time injuries and illnesses: Characteristics and resulting days away from work. *United States Department* of *Labor News, USDL*, Mar 30, 05–521.39Cagnie, B., Danneels, L., Van Tiggelen, D, De Loose, V, Cambier, D. 2007.

3. Bongers PM, Ijmker S, van den Heuvel S, Blatter BM- Epidemiology of work related neck and upper limb problems- *J Occup Rehabil. 2006 Sep; 16(3):279-302.).*

4. Borghouts, J., Koes, B., Bouter, L., 1998. The clinical course and prognostic factors of non-specific neck pain: a systematic review. Pain 77, 1–13. Bovim, G., Schrader, H., Sand, T., 1994. Neck pain in the general population. Spine 19: 1307-9.

5. Farideh Sadeghian, Mehdi Raei, Georgia Ntani, David Coggon mail-Pain in the neck and shoulder has been linked with various psychosocial risk factors, as well as with occupational physical activities- *Published: February 28, 2013DOI:10.1371/journal.*

6. F.Rannveig, BEV3901 Master Thesis, Human Movement Science Program, Norwegian University of Science and Technology, Trondheim, spring 2011.- Association between work stress, physical exercise, and chronic shoulder/neck pain: *the HUNT Study.*

7. G., Silman, A., 2001. Risk factors for neck pain: a longitudinal study in the general population. *Pain* 93, 317–325.

8. Hanvold TN, Wærsted M, Mengshoel AM, Bjertness E, Twisk J,Veiersted KB- A longitudinal study on risk factors for neck and shoulder pain among young adults in the transition from technical school to working life- *Scand J Work Environ Health. 2014 May 23. Pii: 3437. doi: 10.5271/sjweh.3437.*

9. Hogg-Johnson, S., 2000. A review of psychological risk factors in Back and Neck pain. *Spine* 25, 1148-1156.

10. Harcombe H[1], McBride D, Derrett S, Gray A- Physical and psychosocial risk factors for musculoskeletal disorders in New Zealand nurses, postal workers and office workers-*Inj Prev. 2010 Apr;16(2):96-100. doi: 0.1136/ip.2009.021766.*

11. Individual and work related risk factors for neck pain among office workers: a cross sectional study. European Spine Journal 16(5), 679–86.Carragee, E., Hurwitz, E.

12. Julia M Hush[*†], Chris G Maher[†] and Kathryn M Refshauge-Persisting neck pain is common in society- *BMC Musculoskeletal Disorders* 2006, **7**:81 doi:10.1186/1471-2474-7-81.

13. Julia M. Hush, Zoe Michaleff, Christopher G. Maher, and Kathryn Refshauge - Individual, physical and psychological risk factors for neck pain in Australian office workers -*UR Spine J. Oct 2009; 18(10): 1532–1540.Published online Apr 28, 2009.*

14. J H Andersen, A Kaergaard, S Mikkelsen, U F Jensen, P Frost, J P Bonde, N Fallentin,J F Thomsen- Risk factors in the onset of neck/shoulder pain in a prospective study of workers in industrial and service companies- *Occupational Environ Med 2003;60:649–654).*

15. Lacerda, E.M., 2010. Prevalence and association of symptoms of upper extremity repetitive strain injury(RSI) and RSI-like conditions. A cross sectional study in Northerneast Brazil. *BMC Public Health* 5, 107.

16. Neck pain, 2003. *MedicineNet*, viewed 11 janu 2012.

17. Occupational Injury and Illness-Classification Manual- *U.S. Department of Labor Bureau of Labor Statistics, December 1992.*

18. Pieter Coenen, Idsart Kingma, Cécile R.L. Boot, Marjolein Douwes, Paulien M. Bongers & Jaap H. van. Pierre Côté, Gabrielle van der Velde, and Paul M. Peloso- The Burden and Determinants of Neck Pain in Workers –*Eur Spine J. Apr 2008; 17(Suppl 1): 60–74. Feb 29, 2008.*

19. Psychosocial Risk Factors for Neck Pain: A Systematic Review, *AMERICAN JOURNAL OF INDUSTRIAL MEDICINE 39:180–193 (2001).*

20. Visual Analogue Scale- Warden V, Hurley AC, Volicer L. Development and psychometric evaluation of the pain assessment in advanced dementia (PAINAD) Scale. *Journal of the American Medical Directors Association 2003; 4:9-15.*