

## Journal of Molecular Science

www.jmolecularsci.com

ISSN:1000-9035

**Clinical Characteristics and Associated Factors of Neck Pain in Patients with Cervical Spondylosis: A Tertiary Hospital-Based Study in Bangladesh**Md. Abul Kalam Azad<sup>1</sup>, Nadia Rahman<sup>1</sup>, Mohammad Golam Nobil<sup>1</sup>, Md. Imamur Rashid<sup>1</sup>, Md. Nadim Kamal<sup>1</sup>, Ziaur Rahman Chowdhury<sup>1</sup>, M.A. Shakoor<sup>1</sup><sup>1</sup>Department of Physical Medicine and Rehabilitation, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

Email: shanthi.m@sriramachandra.edu.in

**Article Information**

Received: 12-07-2025

Revised: 21-07-2025

Accepted: 07-08-2025

Published: 23-08-2025

**Keywords***Cervical spondylosis, Neck pain, Pain characteristics, Physical activity, Bangladesh***ABSTRACT**

**Background:** Cervical spondylosis is a prevalent degenerative condition of the cervical spine that commonly causes neck pain and neurological symptoms, impairing quality of life. Despite its increasing incidence, limited data exist regarding the clinical features and contributing factors of neck pain among cervical spondylosis patients in Bangladesh. **Objective:** This study aimed to describe the socio-demographic characteristics, pain profiles, and associated factors of neck pain in patients with cervical spondylosis attending a tertiary care center in Bangladesh. **Methods:** A descriptive cross-sectional study was conducted from July 2020 to June 2021 at the Department of Physical Medicine & Rehabilitation, Bangabandhu Sheikh Mujib Medical University. Eighty patients with confirmed cervical spondylosis were recruited via convenient sampling. Data were collected using structured face-to-face interviews after physiotherapy sessions, covering socio-demographics, physical activity, posture, and pain characteristics. Pain severity was assessed by the 10-point Numerical Pain Rating scale. Data were analyzed using descriptive statistics including means, standard deviations, frequencies, and percentages. **Results:** Most participants were aged 36–50 years (62.5%), female (62.5%), and urban residents (67.5%). Service holders (42.5%) and housewives (35%) were the main occupations. Intermittent pain (57.5%), numbness (55%), and burning sensations (47.5%) were common. Pain frequently involved the shoulder (82.5%), neck (77.5%), and forearm (70%). Poor sitting posture and use of a single pillow were prevalent. Despite stressful work environments and long working hours, most participants reported engaging in physical activity. **Conclusion:** Neck pain among cervical spondylosis patients is influenced by demographic, occupational, and lifestyle factors. Addressing ergonomic and lifestyle elements may improve management outcomes. Further research is needed to explore effective multidisciplinary interventions.

**©2025 The authors**

This is an Open Access article distributed under the terms of the Creative Commons Attribution (CC BY NC), which permits unrestricted use, distribution, and reproduction in any medium, as long as the original authors and source are cited. No permission is required from the authors or the publishers. (<https://creativecommons.org/licenses/by-nc/4.0/>)

**INTRODUCTION:**

Pain is widely recognized as a significant public health concern, affecting quality of life and burdening healthcare systems worldwide. According to the World Health Organization, one in five adults experiences pain during their lifetime, and approximately one in ten are diagnosed with chronic pain each year<sup>1</sup>. Among musculoskeletal conditions, neck pain has emerged as a leading cause of disability, with substantial personal and

societal costs<sup>2, 3</sup>. The global point prevalence of neck pain in adults aged 15–74 years ranges from 5.9% to 22.2%, with a mean of 7.6%<sup>2,4</sup>.

One of the most common underlying causes of chronic neck pain is cervical spondylosis, also known as cervical degenerative arthritis<sup>5</sup>. It is a chronic, age-related degenerative condition that affects the intervertebral discs, vertebral bodies, and surrounding ligamentous structures of the cervical spine. Progressive degeneration can lead to disc herniation, osteophyte formation, and ligament hypertrophy, which may compress adjacent nerve roots or the spinal cord, resulting in symptoms such as neck pain, stiffness, numbness, and neurological deficits<sup>6-8</sup>.

Although some individuals with cervical degeneration remain asymptomatic, many present with varying degrees of pain, reduced mobility, and radiculopathy or myelopathy<sup>9, 10</sup>. Neck pain associated with cervical spondylosis may be acute or chronic, with chronic cases more likely to involve mechanical and degenerative factors<sup>8</sup>. Importantly, cervical spondylosis also correlates with psychological comorbidities such as depression, anxiety, and sleep disturbances, further amplifying the disease burden<sup>11, 12</sup>.

A number of risk factors have been identified for neck pain in the general population, including female gender, older age, psychological stress, and occupational hazards such as poor posture or repetitive neck movements<sup>13, 14</sup>. Lifestyle-related factors, such as physical inactivity and prolonged screen use, also contribute to the development of neck pain<sup>15, 16</sup>. According to the Global Burden of Disease Study (2013), neck pain ranks as the fourth leading cause of years lived with disability (YLDs) globally, and second in countries like China, highlighting its serious public health implications<sup>17</sup>.

In the context of Bangladesh, there is a notable gap in the literature regarding the prevalence and clinical characteristics of cervical spondylosis or neck pain in the general population. However, a study conducted among laborers (coolies) reported a high prevalence of cervical spondylosis (51.3%), underscoring its potential public health significance in the country<sup>18</sup>. Given the rising global burden of cervical spondylosis and the lack of localized data, it is essential to investigate the symptom patterns and associated risk factors in this population to guide effective prevention and treatment strategies.

Therefore, this study was conducted to explore the clinical characteristics and associated factors of neck pain in patients with cervical spondylosis attending a super-specialized tertiary hospital in

Dhaka, Bangladesh. The findings aim to support early identification and targeted interventions for cervical spine disorders in resource-limited settings.

## **MATERIALS AND METHODS:**

### **Participant and place:**

This descriptive cross-sectional study was conducted at the Department of Physical Medicine & Rehabilitation, Bangabandhu Sheikh Mujib Medical University (BSMMU), Bangladesh, between July 2020 and June 2021. The study population included patients previously diagnosed with cervical spondylosis by orthopedic specialists who were attending follow-up treatment at the department during the study period.

Participants were recruited using a convenient sampling technique based on the following inclusion criteria: (1) confirmed diagnosis of cervical spondylosis with associated neck pain, (2) both male and female patients, and (3) no age restrictions. Patients presenting with non-specific neck pain, cervical spondylosis accompanied by other pathological conditions, or those who declined to participate were excluded from the study.

### **Data Collection and Analysis**

Data collection was performed through face-to-face interviews conducted immediately after patients completed their physiotherapy sessions. Trained research personnel administered a structured questionnaire consisting of four sections: socio-demographic data, physical activity patterns, posture assessment, and disease-related clinical characteristics including the nature, duration, and severity of pain. Pain severity was assessed using the validated 10-point Numerical Pain Rating (NPR) scale, widely employed to measure chronic pain intensity. The questionnaire was pre-tested and refined prior to the commencement of data collection to ensure reliability and clarity.

After data collection, all questionnaires were reviewed for completeness and consistency. Data were subsequently entered and analyzed using SPSS software version 22.0. Descriptive statistics were applied to summarize the study variables, with continuous data presented as means  $\pm$  standard deviations (SD) and categorical data as frequencies and percentages. Findings were presented in tabular and graphical formats to facilitate clear and concise interpretation.

## **RESULTS:**

Between July 2020 and June 2021, this descriptive cross-sectional study was carried out at Bangabandhu Sheikh Mujib Medical University's

(BMU) Department of Physical Medicine & Rehabilitation in Bangladesh. The study population included patients who had previously been diagnosed with cervical spondylosis by orthopedic experts and were receiving follow-up care at the department during the study period.

**Table-1. Socio-demographic Characteristics of Study Participants (n = 80)**

Characteristics	n=80	%
<b>Age group (years)</b>		
Mean ± SD	46.06 ± 9.56	
20–35	8	10.0
36–50	50	62.5
51–65	22	27.5
<b>Gender</b>		
Female	50	62.5
Male	30	37.5
<b>Habitat</b>		
Rural	26	32.5
Urban	54	67.5
<b>Occupation</b>		
Service holder	34	42.5
Housewife	28	35.0
Farmer	2	2.5
Businessman	6	7.5
Day laborer	6	7.5
Retired	4	5.0
<b>Education</b>		
Primary	24	30.0
Secondary	12	15.0
Higher Secondary	16	20.0
Graduate or above	28	35.0

A total of 80 patients participated in this study. The majority were aged between 36 and 50 years (n = 50, 62.5%), followed by those aged 51 to 65 years (n = 22, 27.5%), and a smaller proportion were between 20 and 35 years old (n = 8, 10%). Female participants accounted for 62.5% (n = 50), while males comprised 37.5% (n = 30). Most participants resided in urban areas (n = 54, 67.5%), with the remainder living in rural settings (n = 26, 32.5%). Regarding occupation, service holders were the largest group (n = 34, 42.5%), followed by housewives (n = 28, 35%). Smaller numbers included businessmen and day laborers (n = 6, 7.5% each), retired individuals (n = 4, 5%), and farmers (n = 2, 2.5%). Educational attainment varied, with 35% (n = 28) having graduate or higher qualifications, 20% (n = 16) completed higher secondary education, 15% (n = 12) finished secondary education, and 30% (n = 24) had primary education (Table 1).

**Table-2. Job Environment, Working Hours, Previous Trauma, and Physical Activity Among Participants (n = 80)**

Characteristics	n	%
<b>Job environment</b>		
Stressful	44	55.0
Healthy	36	45.0
<b>Working hours per day</b>		
> 8 hours	50	62.5
≤ 8 hours	30	37.5
<b>Previous trauma</b>		

Yes	6	7.5
No	74	92.5
<b>Physical activity</b>		
No	16	20.0
Yes	64	80.0

Among the 80 participants, slightly more than half (n = 44, 55%) reported working in stressful job environments, while 45% (n = 36) described their work environment as healthy. A majority of participants (n = 50, 62.5%) worked more than 8 hours per day, compared to 37.5% (n = 30) who worked 8 hours or less. Only a small proportion of participants (n = 6, 7.5%) reported a history of previous trauma, with the vast majority (n = 74, 92.5%) having no such history. Regarding physical activity, most participants (n = 64, 80%) engaged in some form of physical activity, whereas 20% (n = 16) were physically inactive. (Table 2)

**Table-3. Participants' Pillow Usage, Sitting Posture Quality, and Mattress Types (n = 80)**

Characteristics	n	%
<b>Use of pillow</b>		
One	52	65.0
None	6	7.5
Two	22	27.5
<b>Sitting posture</b>		
Fair	36	45.0
Good	20	25.0
Poor	24	30.0
<b>Type of mattress</b>		
Firm	14	17.5
Hard	52	65.0
Soft	14	17.5

Among the 80 participants, the majority reported using one pillow during sleep (n = 52, 65%), while 27.5% (n = 22) used two pillows and a small proportion (n = 6, 7.5%) did not use any pillow. Regarding sitting posture, nearly half of the participants described their posture as fair (n = 36, 45%), followed by 30% (n = 24) reporting poor posture, and 25% (n = 20) reporting good posture. The type of mattress used varied, with most participants sleeping on a hard mattress (n = 52, 65%), while firm and soft mattresses were used equally by 17.5% (n = 14) of participants each. (Table 3).

**Table-4. Distribution of Different Types of Pain Reported by Participants (n = 80)**

Type of Pain	n	%
Dull ache	26	32.5
Tingling	20	25.0
Sharp pain	20	25.0
Paresthesia	34	42.5
Burning pain	38	47.5
Intermittent	46	57.5
Constant	30	37.5
Numbness	44	55.0

Table 4 illustrates the distribution of various pain types reported by the 80 participants. The most

common pain characteristic was intermittent pain, reported by 57.5% (n = 46) of participants, followed by numbness in 55% (n = 44) and burning pain in 47.5% (n = 38). Paresthesia was experienced by 42.5% (n = 34), while constant pain was reported by 37.5% (n = 30). Less frequent types included dull ache (32.5%, n = 26), tingling (25%, n = 20), and sharp pain (25%, n = 20). (Table 4)

**Table 5. Frequency and Percentage of Pain Locations Among Participants (n = 80)**

Pain Location	n	%
Neck	77.5	62
Cervico-scapular	17.5	14
Shoulder	82.5	66
Forearm	70.0	56
Hand	47.5	38

Table 5 presents the distribution of pain locations reported by the 80 participants. The most commonly reported site of pain was the shoulder, with 82.5% (n = 66) of participants affected, followed closely by neck pain, reported by 77.5% (n = 62). Pain in the forearm was also frequent, affecting 70% (n = 56) of participants. Nearly half of the participants (47.5%, n = 38) experienced pain in the hand, while cervico-scapular pain was the least reported site, affecting 17.5% (n = 14).

## DISCUSSION:

Neck pain is recognized globally as a significant public health issue, contributing substantially to disability and impairing quality of life<sup>1,19</sup>. International Association for the Study of Pain, 2020). Cervical spondylosis, a chronic degenerative condition of the cervical spine, is a major cause of neck pain and associated neurological symptoms<sup>5, 8</sup>. The prevalence of neck pain observed in our study aligns with previous global reports indicating that a considerable proportion of adults suffer from this condition<sup>2, 20</sup>.

Consistent with existing literature, the majority of our participants were middle-aged adults, reflecting the age-related progression of cervical spondylosis<sup>21, 22</sup>. The higher prevalence among females in our cohort corroborates findings from other studies that suggest women are more prone to neck pain, potentially due to a combination of biological, psychosocial, and occupational factors<sup>23,24</sup>. Furthermore, the predominance of urban residents and those engaged in stressful or prolonged working hours highlights occupational and environmental influences that may exacerbate the risk and severity of cervical spine degeneration<sup>25</sup>. Physical activity was common among our patients, consistent with evidence supporting exercise as a beneficial factor in managing cervical spondylosis<sup>26, 27</sup>. However, the frequent reporting of poor sitting posture underscores the importance of

ergonomic interventions, as improper posture has been implicated as a significant contributor to neck pain<sup>28, 29</sup>.

The variety of pain characteristics reported—including intermittent pain, burning sensations, numbness, and paresthesia—reflects the complex pathophysiology of cervical spondylosis, which involves both mechanical nerve root compression and inflammatory processes<sup>7,8</sup>. The common occurrence of shoulder and forearm pain aligns with radicular symptomatology frequently observed in cervical spondylosis<sup>3, 30</sup>.

Our findings emphasize the substantial individual and societal burden of cervical spondylosis, supporting global data that rank neck pain among the leading causes of disability worldwide<sup>31, 1</sup>. The economic implications, including healthcare costs and productivity loss associated with chronic neck pain, have been well documented<sup>33, 34</sup>.

While this study provides valuable insights into the clinical and demographic profile of cervical spondylosis patients in Bangladesh, its cross-sectional design limits causal interpretations. The use of convenience sampling may also limit the generalizability of the findings. Future research employing longitudinal designs and larger, more representative samples is warranted to better elucidate risk factors and outcomes. Additionally, comprehensive, multidisciplinary management approaches focusing on modifiable factors such as occupational ergonomics and physical activity should be explored to improve patient outcomes.

## CONCLUSION:

This study highlights the significant burden of neck pain among patients with cervical spondylosis attending a tertiary care center in Bangladesh. The findings reveal that middle-aged females, urban residents, and those engaged in stressful occupations with prolonged working hours are predominantly affected. Diverse pain characteristics, including intermittent and neuropathic symptoms, are common and often involve multiple anatomical sites. Poor posture and suboptimal sleeping habits may further contribute to symptom severity. These insights emphasize the need for targeted interventions focusing on ergonomic modifications, physical activity promotion, and comprehensive patient education to mitigate the impact of cervical spondylosis. Further longitudinal studies are recommended to explore causal relationships and evaluate the effectiveness of multidisciplinary management strategies.

## FUNDING:

This research did not receive any specific grant

from funding agencies in the public, commercial, or not-for-profit sector.

### ETHICS APPROVAL:

The office of the Ethics Committee granted ethics approval for this study,

### REFERENCE:

- Goldberg DS, McGee SJ. Pain as a global public health priority. *BMC Public Health*. 2011;11:770. doi: 10.1186/1471-245811-770.
- Cote P, Cassidy JD, Carroll L. The treatment of neck and low back pain: who seeks care? who goes where? *Med Care*. 2001;39(9):956-67.
- Daffner SD, Hilibrand AS, Hanscom BS, Brislin BT, Vaccaro AR, Albert TJ. Impact of neck and arm pain on overall health status. *Spine (Phila Pa 1976)*. 2003;28(17):2030-5. doi:10.1097/01.brs.0000083325.27357.39.
- Fejer R, Kyvik KO, Hartvigsen J. The prevalence of neck pain in the world population: a systematic critical review of the literature. *Eur Spine J*. 2006;15(6):834-48. doi: 10.1007/s00586004-0864-4.
- Hirsh LF. Cervical degenerative arthritis. *Postgrad Med*. 1983;74(1):123-30. doi: 10.1080/00325481.1983.11697906.
- Xiong W, Li F, Guan H. Tetraplegia after thyroidectomy in a patient with cervical spondylosis: a case report and literature review. *Medicine (Baltimore)*. 2015;94:e524.
- Brain WR, Knight GC, Bull JW. Discussion of rupture of the intervertebral disc in the cervical region. *Proc R Soc Med*. 1948;41(8):509-16.
- Binder AI. Cervical spondylosis and neck pain. *Bmj*. 2007;334(7592):527-31. doi: 10.1136/bmj.39127.608299.80.
- Kelly JC, Groarke PJ, Butler JS, Poynton AR, O'Byrne JM. The natural history and clinical syndromes of degenerative cervical spondylosis. *Adv Orthop*. 2012;2012:393642.
- Wang C, Tian F, Zhou Y, He W, Cai Z. The incidence of cervical spondylosis decreases with aging in the elderly, and increases with aging in the young and adult population: a hospital-based clinical analysis. *Clin Interv Aging*. 2016;11:47-53.
- Stoffman MR, Roberts MS, King JJ. Cervical spondylotic myelopathy, depression, and anxiety: a cohort analysis of 89 patients. *Neurosurgery*. 2005;57:307-13. 307-313
- Paanalahti K, Holm LW, Magnusson C, Carroll L, Nordin M, Skillgate E. The sex-specific interrelationship between spinal pain and psychological distress across time in the general population. Results from the Stockholm public health study. *Spine Journal*. 2014;14:1928-35.
- Hogg-Johnson S, van der Velde G, Carroll LJ, Holm LW, Cassidy JD, Guzman J, et al. The burden and determinants of neck pain in the general population: results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. *J Manipulative Physiol Ther*. 2009;32(2 Suppl):S46-60. doi: 10.1016/j.jmpt.2008.11.010.
- Strine TW, Hootman JM. US national prevalence and correlates of low back and neck pain among adults. *Arthritis Rheum*. 2007;57(4):656-65. doi: 10.1002/art.22684.
- Klussmann A, Gebhardt H, Liebers F, Rieger MA. Musculoskeletal symptoms of the upper extremities and the neck: a cross-sectional study on prevalence and symptom-predicting factors at visual display terminal (VDT) workstations. *BMC Musculoskelet Disord*. 2008;9:96.
- Fernandez-de-las-Penas C, Hernandez-Barrera V, Alonso-Blanco C, Palacios-Cena D, Carrasco-Garrido P, Jimenez-Sanchez S, et al. Prevalence of neck and low back pain in community dwelling adults in Spain: a population-based national study. *Spine (Phila Pa 1976)*. 2011;36(3):E213-9. doi: 10.1097/BRS.0b013e3181d952c2.
- Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet*. 2015;386:743-800.
- Mahbub MH, Laskar MS, Seikh FA, Altaf MH, Inoue M, Yokoyama K, et al. Prevalence of cervical spondylosis and musculoskeletal symptoms among coolies in a city of Bangladesh. *J Occup Health*. 2006;48(1):69-73.
- International Association for the Study of Pain: Unrelieved pain is a major global healthcare problem. <http://www.iasp-pain.org/AM/Template.cfm?Section=Home&Template=/CM/ContentDisplay.cfm&ContentID=2908>.
- Fejer R, Kyvik KO, Hartvigsen J. The prevalence of neck pain in the world population: a systematic critical review of the literature. *Eur Spine J*. 2006;15(6):834-48. doi: 10.1007/s00586-004-0864-4.
- Badley EM, Tennant A. Changing profile of joint disorders with age: findings from a postal survey of the population of Calderdale, West Yorkshire, United Kingdom. *Ann Rheum Dis*. 1992;51(3):366-71.
- Alshami AM. Prevalence of spinal disorders and their relationships with age and gender. *Saudi Med J*. 2015;36(6):725-30. doi: 10.15537/smj.2015.6.11095.
- Paanalahti K, Holm LW, Magnusson C, Carroll L, Nordin M, Skillgate E. The sex-specific interrelationship between spinal pain and psychological distress across time in the general population. Results from the Stockholm Public Health Study. *Spine J*. 2014;14(9):1928-35. doi: 10.1016/j.spinee.2013.11.017.
- Kaaria S, Laaksonen M, Rahkonen O, Lahelma E, Leino-Arjas P. Risk factors of chronic neck pain: a prospective study among middle-aged employees. *Eur J Pain*. 2012;16(6):911-20. doi:10.1002/j.1532-2149.2011.00065.x.
- Rasmussen-Barr E, Grooten WJ, Hallqvist J, Holm LW, Skillgate E. Are job strain and sleep disturbances prognostic factors for neck/shoulder/arm pain? A cohort study of a general population of working age in Sweden. *BMJ Open*. 2014;4(7):e005103. doi: 10.1136/bmjopen-2014-005103.
- Zhen PC, Zhu LG, Gao JH, Yu J, Feng MS, Wei X, et al. [Clinical observation on improvement of motion range of cervical spine of patients with cervical spondylotic radiculopathy treated with rotation-traction manipulation and neck pain particles and cervical neck pain rehabilitation exercises]. *Zhongguo Gu Shang*. 2010;23(10):750-3.
- Hirpara KM, Butler JS, Dolan RT, O'Byrne JM, Poynton AR. Nonoperative modalities to treat symptomatic cervical spondylosis. *Adv Orthop*. 2012;2012:294857. doi: 10.1155/2012/294857.
- Gemmell H, Dunford PJ. A cross-sectional study of the prevalence of neck pain, decreased cervical range of motion and head repositioning accuracy in forwards and backs in rugby union. *Clin Chiropr*. 2007;10(4):187-94. doi: 10.1016/j.cclch.2007.09.002.
- Cohen SP. Epidemiology, diagnosis, and treatment of neck pain. *Mayo Clin Proc*. 2015;90(2):284-99. doi: 10.1016/j.mayocp.2014.09.008.
- Lipetz JS, Lipetz DI. Disorders of the cervical spine. In: DeLisa JA, Gans BM, eds. *Physical Medicine and Rehabilitation: Principles and Practice*. 4th ed. Baltimore, MD: Lippincott Williams and Wilkins. 2005.
- Hoy D, Brooks P, Blyth F, Buchbinder R. The Epidemiology of low back pain. *Best Pract Res Clin Rheumatol*. 2010;24(6):76981. doi: 10.1016/j.berh.2010.10.002.