



Incidence of neck pain and disability in stock market brokers using Nordic Musculoskeletal Questionnaire and Neck Disability Index

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Abstract

Background: Musculoskeletal disorders (MSDs) represent one of the most prevalent causes of work-related illness, prolonged sick leave and long-term disability, and are recognized as the second leading cause of disability globally. Among MSDs, neck pain is a major occupational health concern, particularly among intensive computer users. It is estimated to affect approximately 34.4% of office workers every year worldwide, with global prevalence ranging from 16.7% to 75.1% in the adult population. The cervical spine has a natural C-shaped lordosis that supports the head but is least protected, making it vulnerable to postural stress. Sustained static postures, forward head positioning, prolonged computer use and psychosocial stress contribute to neck pain disorder (NPD). In India, the Bombay Stock Exchange (BSE) and National Stock Exchange (NSE) are two premier financial institutions regulated by SEBI. Stockbrokers, also known as investment advisors, form the backbone of the financial system by connecting investors to markets. Their job demands continuous sitting in front of trading terminals from 9 a.m. to 4 p.m., involving high physical and mental demands. Extended computer use in brokerage offices has been linked to discomfort in neck, shoulder, back and hand. Despite this high-risk profile, there is a significant dearth of research on musculoskeletal pain in this occupational group in India. Hence, this study was undertaken as a baseline investigation.

Method: An observational cross-sectional study was conducted at Bombay Stock Exchange (BSE), Mumbai, Maharashtra. A total of 355 stock market brokers were recruited using purposive sampling after obtaining institutional ethical approval and written informed consent. Inclusion criteria were: stockbrokers working at BSE Mumbai, age 30-50 years, more than one year of work experience, minimum 6 hours of daily computer work and ability to comprehend English. Exclusion criteria were: history of cervical spine surgery, neurological, musculoskeletal condition other than neck pain or cardiovascular conditions, traumatic history, congenital disorders, cervical radiculopathy and non-cooperative participants. The study was conducted in two phases. Phase 1 screened all participants using the standardized Nordic Musculoskeletal Questionnaire for 12-month and 7-day prevalence of neck pain. Phase 2 assessed participants reporting neck pain (n=281) for functional disability using the Neck Disability Index (NDI). Data were analysed using descriptive statistics in Microsoft Excel with results presented as frequency, percentage, mean, standard deviation, pie charts, bar graphs and histogram.

Results: Out of 355 respondents, majority were males 63.1% (n=224) compared to females 36.9% (n=131), reflecting gender demographics of the profession. Mean age was 41.9 ± 5.83 years, with largest age group 41-45 years 34.9% (n=124), followed by 46-50 years 30.1% (n=107). Majority reported working 6 hours per day 54.9% (n=195) and 7 hours 44.8% (n=159) in static posture. The 12-month incidence of neck pain was 79.15% (n=281) and 20.8% (n=74) reported no neck pain. Among those with neck pain (n=281), the mean NDI score was 25.31% indicating moderate disability on average, median was 24%. Disability distribution was: mild disability 30.9% (n=87), moderate disability 65.8% (n=185), severe disability 3.2% (n=9), with no participants in crippled or bed-bound categories. Histogram of NDI scores showed distribution centred around moderate range (20-40%) with peak at 20-25%. Gender-wise analysis showed moderate disability as most common in both genders (males n=125, females n=60), severe disability was observed in 3 males and 6 females, suggesting slightly higher functional impairment in females when affected.

Conclusion: The incidence of neck pain among BSE stock market brokers is highly significant (79.15%) with predominant moderate functional disability (65.8%). Prolonged static computer work, forward head posture and high job stress are probable contributing factors. The NDI scores clustered in the lower-moderate range indicate that disability is significant but still in a reversible stage, ideal for early physiotherapy intervention. The study highlights urgent need for workplace ergonomic assessment, micro-breaks, postural correction, deep neck flexor strengthening, and regular screening to reduce pain, improve productivity and quality of life. This is the first baseline study on BSE brokers in India and provides foundation for future interventional research.

Keywords: Neck pain, Neck Disability Index, Nordic Musculoskeletal Questionnaire, Stock market brokers, Musculoskeletal disorders, Occupational health, Ergonomics, BSE, Work-related neck disorders

Introduction

Musculoskeletal disorders are recognised as one of the most frequently reported causes of work-related illness, long-term sick leave and disability pensions, placing a substantial burden on both individual workers and healthcare systems. Globally, musculoskeletal disorders (MSDs) rank as the second leading cause of disability, affecting a vast

proportion of the working population across diverse occupational sectors. A large number of workers, particularly those engaged in physically demanding, mentally demanding or sedentary computer-based jobs, are disproportionately affected. Among the spectrum of musculoskeletal conditions, neck pain has emerged as a major public health issue, contributing significantly to

discomfort, functional limitation and disability both at work and during daily life activities. Epidemiological data suggests that every year, it impacts about 34.4% of office workers worldwide, making it one of the most common work-related complaints ^[1, 2]. Neck pain is clinically described as discomfort or pain that occurs in the anatomical area stretching from the base of the skull near the ears down to the upper back or shoulder region. It is considered one of the major musculoskeletal disorders in the adult population, and its prevalence in the world ranges widely from 16.7% to 75.1% depending upon the population studied, assessment tool and occupational exposure. Individuals who spend longer durations on computers often report complaints of persistent neck discomfort and have been shown to have a higher likelihood of developing chronic neck pain. Symptoms of neck pain include general aches and pain that can manifest as postural fatigue in the neck, arms and shoulder, or as persistent pain and discomfort in the soft tissues around the neck and shoulder girdle ^[3, 4, 5]. Anatomically, a natural 'C' shaped lordotic curve is present in the cervical spine. This curvature supports the head and maintains sagittal balance, but it is the least protected segment compared to the rest of the spine, making it highly vulnerable to injury and painful conditions which ultimately restrict motion. When the head is positioned too far backward, this curve becomes exaggerated; but when it is held too far forward in a protruded posture, the curve becomes flattened. Both these altered positions put extra stress and pressure on the muscles, ligaments, facet joints, and intervertebral discs around the neck, often leading to pain, stiffness and functional discomfort ^[3]. The impact of neck pain extends beyond physical symptoms. Across many countries, work performance is significantly affected due to neck pain. It can influence physical health, emotional well-being, and social interaction while also creating substantial financial burdens for both society as well as businesses in terms of absenteeism, presenteeism and healthcare costs. The number of people affected by neck pain is expected to rise substantially in the coming years as the population of middle- and low-income countries continue to age and as computer-based occupations expand rapidly ^[4]. Work-related neck disorders are one of the most common issues faced by office workers, especially among those who are intensive computer users. The causes of work-related neck pain disorders (NPD) are multiplex and compound, involving both physical and psychosocial factors. Research suggests that a combination of individual characteristics - such as age and gender - along with work-related factors like prolonged sitting, repetitive tasks, and sustained static posture, all together contribute to the risk of developing neck pain. Psychosocial elements, including high job demands, low job control and occupational stress, have also been identified as remarkable contributors among office workers and are known to amplify muscle tension and pain perception ^[6, 7]. The financial system of each country plays a vital role in boosting its growth and development, as it offers a variety of financial assets and investment avenues to the common general public. The stock exchange of every country plays the role of a premier leading institution in the stock market ecosystem. In India, the stock markets are strictly regulated by the Securities and Exchange Board of India (SEBI). The Bombay Stock Exchange (BSE) and National Stock Exchange (NSE) are India's two major stock exchanges and are among the oldest and largest exchanges

in Asia. A stockbroker is a financial expert and registered representative who places orders in the market on behalf of customers, executes trades and provides investment advisory services. Stockbrokers play a crucial role in the financial system of the country and connect investors with the market. In India, this industry is growing rapidly, with brokers leveraging revolutionary technologies to operate and network worldwide. Their unique role has been instrumental in the swift development of the capital market, positioning them as the backbone of the financial sector ^[9]. Occupational health studies show that office workers, specifically intensive computer users, are at high elevated risk for neck pain. The rise in computer-based work contributes to poor posture and repetitive movements, primarily affecting the cervical and head regions. In office workers, musculoskeletal disorders of the neck and shoulder are frequently associated with prolonged static postures and lack of ergonomic awareness. Sustained muscle activity at low thresholds, intracellular calcium accumulation, impaired local circulation and other homeostatic changes in the muscle fibres contribute to symptom development and chronicity. Consequently, pain intensity tends to peak with extended static muscle activity and repetitive occupational tasks. Work-related neck pain has been consistently associated with compound ergonomic factors, including the duration of computer use, frequency or interval of rest breaks, keyboard typing techniques, monitor positioning, chair height and the type and utilization of input devices such as mouse and keyboard ^[7, 3, 5]. Despite this well-established association, brokerage professionals remain an under-explored occupational group. Extended computer use in brokerage offices has been associated with musculoskeletal discomfort affecting the neck, back, shoulder and hand muscles. The trading floor demands continuous vigilance, rapid decision-making and sustained visual attention, which further increases static loading on the cervical spine. Hence, understanding the burden of neck pain in this population becomes essential for developing targeted preventive strategies ^[8].

Methodology

Study Design and Setting

The present study adopted an observational cross-sectional design to assess the incidence of neck pain and disability among stock market brokers. The study was conducted at Bombay Stock Exchange [BSE], Mumbai, Maharashtra. A total of 355 participants were recruited using purposive sampling technique. The research included brokers working in various brokerage firms within BSE premises, representing a diverse cohort of trading professionals operating under similar ergonomic conditions during market working hours.

Data Sources and Study Population

The study population comprised clinical stockbrokers with at least one year of clinical work experience in stock trading. The target population included dealers working at BSE Mumbai. Inclusion Criteria: Stock market dealers working in Bombay Stock Exchange, Mumbai age group between 30-50 years, More than one year of experience, minimum 6 hours of work on computer per day. Exclusion Criteria: Subject having past history of cervical spine surgery Subject with neurological conditions,

musculoskeletal conditions other than neck pain and cardiovascular conditions. Subjects who are not cooperative and not willing to participate, Subject with any traumatic history, congenital disorder or cervical radiculopathy, Information was collected by self-designed demographic sheet along with two standardized validated tools: Nordic Musculoskeletal Questionnaire and Neck Disability Index. The questionnaire was expert-validated and administered in pen-paper format. Each participant received an information sheet and consent form before participation. Responses were recorded and analysed using Microsoft Excel through descriptive statistics.

Ethical Considerations

The study has been approved by the Institutional Ethics Committee of TMV's Lokmanya Tilak College of Physiotherapy, Kharghar. Participants received a thorough explanation regarding the goals and procedure of the study before data collection. All participants provided written informed consent, which served as an indication of their consent. Participation was entirely voluntary, and the data of the participants were kept confidential and anonymous during the study period. Participants were informed that withdrawal was permitted at any stage without affecting their relationship with the institution.

Outcome Measures

Nordic Musculoskeletal Questionnaire (NMQ): A standardized and validated questionnaire used to screen musculoskeletal disorders across 9 body regions (neck, shoulder, elbow, wrist, upper back, lower back, hip, knee, ankle). It assesses 12-month and 7-day prevalence of musculoskeletal discomfort, work prevention and physician consultation. In this study, it was used specifically to determine the presence or absence of neck pain. **Neck Disability Index (NDI):** A 10-item questionnaire assessing functional disability due to neck pain including pain intensity, personal care, lifting, reading, headaches, concentration, work, driving, sleeping and recreation. Each item scored 0-5, total score 0-50 converted to percentage: 0-20% mild disability, 20-40% moderate disability, 40-60% severe disability, 60-80% crippled, 80-100% bed-bound. It is a validated and reliable tool with excellent test-retest reliability (ICC = 0.88) and minimum clinically important difference of 5.5.

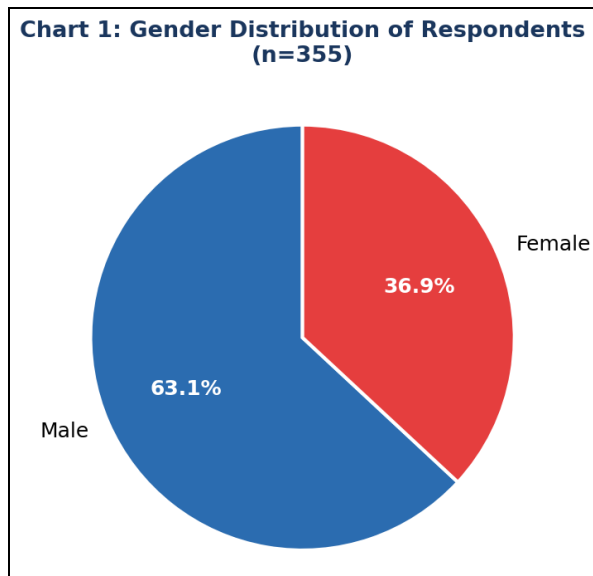
Statistical analysis

Descriptive Statistical analysis done of data collected using MS Excel. Data collected statistically analysed and presented in form of pie charts, bar graph and histogram along with tabular format. Total 355 responses from different Stock Market Brokers of BSE is collected.

Results

Table 1: Gender-wise Distribution of Respondents

Category	Number (n)	Percentage (%)
Male	224	63.1%
Female	131	36.9%
Total	355	100%



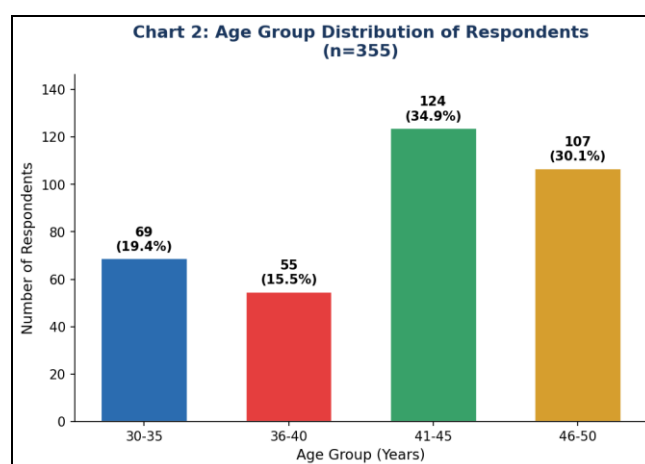
Graph 1: Gender Distribution of Respondents

Interpretation

Majority of the respondents were male (63.1%, n=224) compared to female respondents (36.9%, n=131), reflecting the gender demographics of the stock broking profession in Mumbai.

Table 2: Age-wise Distribution of Respondents

Category	Number (n)	Percentage (%)
30-35 years	69	19.4%
36-40 years	55	15.5%
41-45 years	124	34.9%
46-50 years	107	30.1%
Total	355	100%



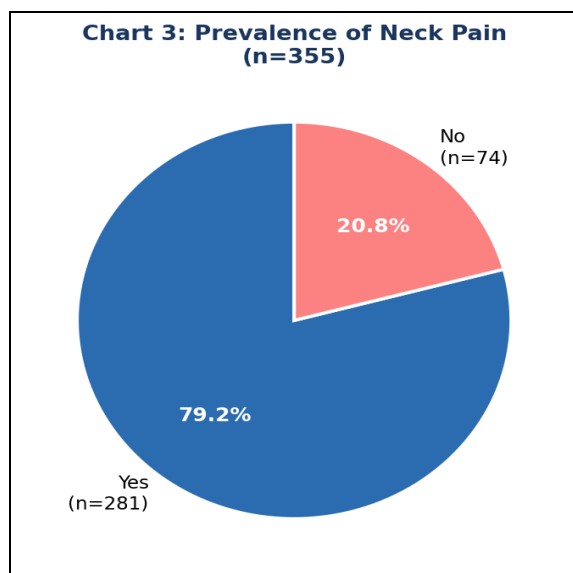
Graph 2: Age Group Distribution

Interpretation

The largest age group was 41-45 years (34.9%, n=124), followed by 46-50 years (30.1%, n=107). The mean age of the respondents was 41.9 ± 5.83 years, indicating a predominantly middle aged working population.

Table 3: Incidence of Neck Pain Among Respondents

Category	Number (n)	Percentage (%)
Presence of Neck Pain (Yes)	281	79.2%
No Neck Pain (No)	74	20.8%
Total	355	100%



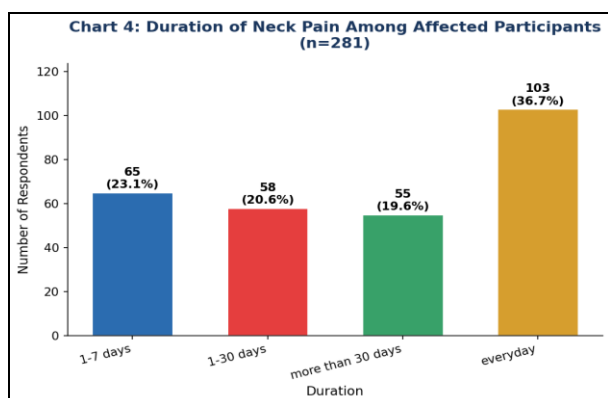
Graph 3: Incidence of Neck Pain

Interpretation

A high incidence of neck pain was observed among stock brokers: 79.2% (n=281) reported the presence of neck pain. This indicates a significant occupational health concern in this sedentary desk-bound profession.

Table 4: Duration of Neck Pain Among Affected Participants

Category	Number (n)	Percentage (%)
1–7 Days	65	23.1%
1–30 Days	58	20.6%
More than 30 Days	55	19.6%
Everyday	103	36.7%
Total	281	100%



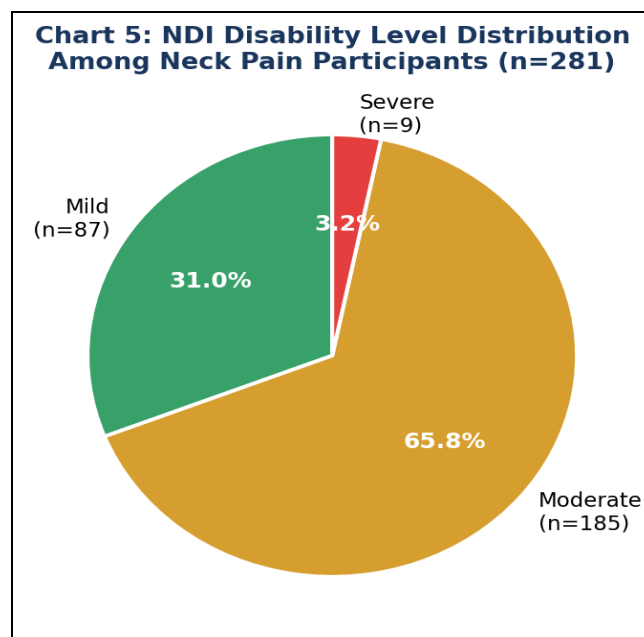
Graph 4: Duration of Neck Pain

Interpretation

Among participants with neck pain (n=281), the majority (36.7%, n=103) reported experiencing pain every day, suggesting a chronic pattern of neck pain in this occupational group. Pain lasting 1–7 days was reported by 23.1% (n=65), 1–30 days by 20.6% (n=58), and more than 30 days by 19.6% (n=55).

Table 5: NDI Disability Level Distribution

Category	Number (n)	Percentage (%)
Mild (0–20%)	87	30.9%
Moderate (20–40%)	185	65.8%
Severe (40–60%)	9	3.2%
Total (with neck pain)	281	100%



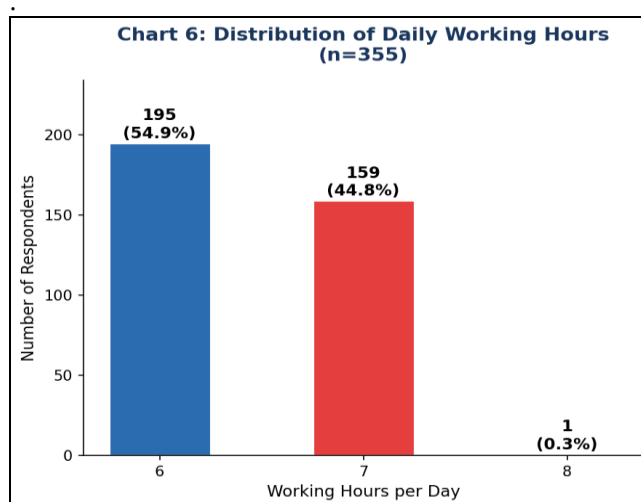
Graph 5: NDI Disability Level Distribution

Interpretation

Among participants with neck pain (n=281), 65.8% of stock brokers with neck pain (n=185) fell in moderate disability category, which means pain was significantly interfering with their daily activities. 30.9% (n=87) had mild disability which indicated presence of pain but not severely limiting their function. And only 3.2% (n=9) had severe disability. Importantly no participants was in the crippled or bed bound category.

Table 6: Distribution of Daily Working Hours

Category	Number (n)	Percentage (%)
6 Hours/Day	195	54.9%
7 Hours/Day	159	44.8%
8 Hours/Day	1	0.3%
Total	355	100%



Interpretation

The majority of respondents (54.9%, n=195) reported working 6 hours per day at their workstations, while (44.8%, n=159) worked 7 hours. Prolonged static posture during these working hours is a recognised risk factor for developing neck pain and associated musculoskeletal disorders.

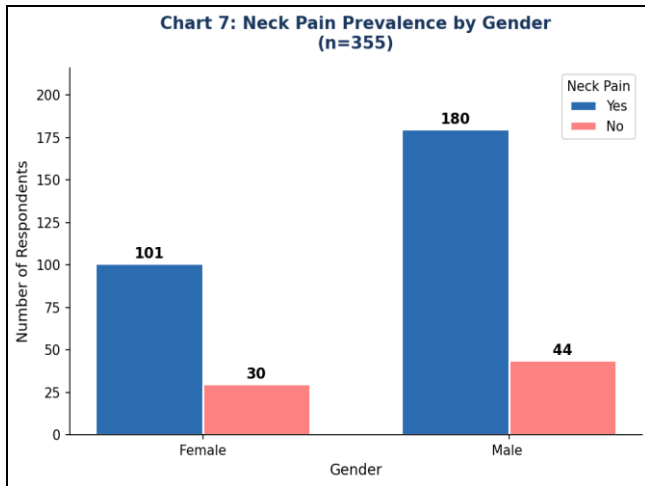


Table 7: Neck Pain Incidence by Gender

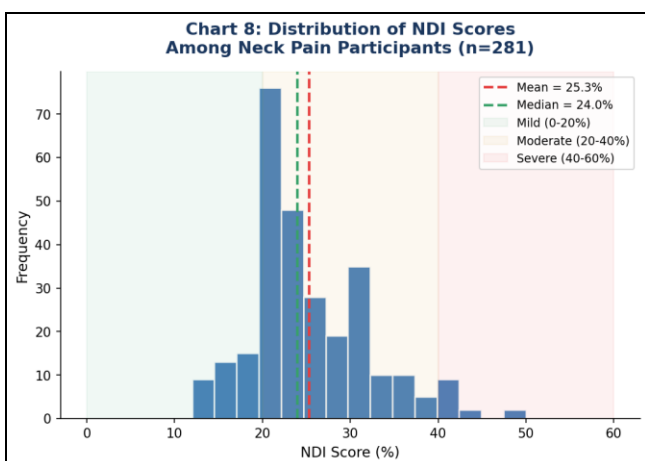
Category	Number (n)	Percentage (%)
Male – With Neck Pain	180	80.4% of males
Male – No Neck Pain	44	19.6% of males
Female – With Neck Pain	101	77.1% of females
Female – No Neck Pain	30	22.9% of females

Interpretation

Neck pain incidence was high in both genders. Among males, 80.4% (n=180 of 224) reported neck pain, while 77.1% (n=101 of 131) of female respondents reported neck pain. The slightly higher prevalence in males may reflect the greater proportion of males in the sample, though both genders show a similarly high burden of neck pain.

Table 8: NDI Score Distribution (Histogram) Disability Interpretation Scale (NDI Reference)

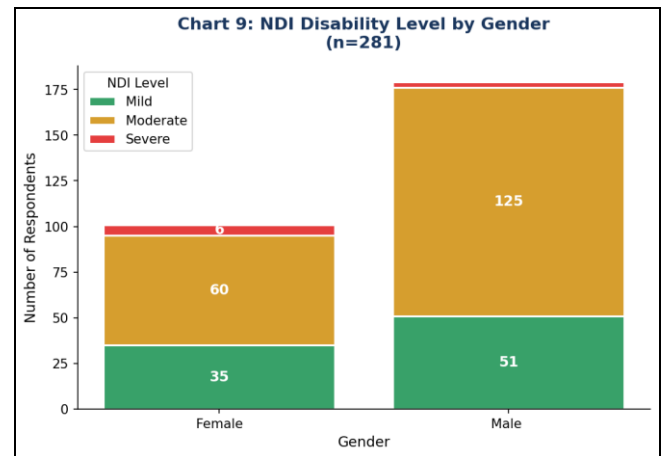
NDI Score Range	Disability Interpretation
0 – 20%	Minimal / Mild Disability
20 – 40%	Moderate Disability
40 – 60%	Severe Disability
60 – 80%	Crippled
80 – 100%	Bed-bound / Exaggerating Symptoms



Interpretation

The mean NDI score was 25.31%, indicating moderate disability on average. The majority of affected stock brokers (65.8%, n=185) fell in the moderate disability category, while 30.9% (n=87) had mild disability. Only 3.2% (n=9) presented with severe disability. No participant scored in the crippled or bed-bound range.

The histogram of NDI scores reveals a distribution centred around the moderate disability range (20–40%). The mean NDI score is 25.31% and the median is 24%, both lying in the moderate disability category. This confirms that neck pain in stock brokers is predominantly of moderate functional impact.



Graph 9: NDI Disability Level by Gender

Interpretation

Among neck pain participants, moderate disability was the most common level in both genders (males: n=125, females: n=60). Severe disability was observed in 3 males and 6 females, suggesting females may experience slightly greater functional impairment when affected by neck pain. Mild disability was reported by 51 males and 35 females.

Discussion

The present study was conducted to assess the incidence of neck pain and associated functional disability among stock market brokers aged 30–50 years working at the Bombay Stock Exchange (BSE), Mumbai. The Nordic Musculoskeletal Questionnaire (NMQ) and Neck Disability Index (NDI) were used as standardized assessment tools for evaluating neck pain and the related functional disability. The study found a remarkably high incidence of neck pain among the participants. Out of 355 respondents, 281 (79.2%) reported experiencing neck pain. This prevalence is higher than that generally reported among office workers, where neck pain has been found to occur in approximately 60–70% of individuals⁽⁸⁾. The higher prevalence observed in the present study may be related to the specific working conditions of stock market brokers. Their occupation involves prolonged periods of computer use, maintaining static postures, repetitive keyboard activities, and considerable mental stress associated with market volatility⁽⁸⁾. In addition, the limited opportunity to take regular physical breaks during working hours may further contribute to the development of neck pain.

The high occurrence of neck pain observed in the present study suggests that occupational factors may have an important role in the development of these symptoms among stock market brokers. Their work requires them to remain in relatively fixed positions for long periods while continuously working on computers and monitoring market activities. Prolonged static postures can place continuous strain on the muscles and structures of the neck. Repetitive keyboard use and sustained computer work may add to this strain, particularly when adequate movement and rest

periods are not incorporated into the working day. The high level of mental stress associated with stock market activities may also contribute to increased muscle tension and discomfort⁽⁸⁾.

The findings also indicate that neck pain is not merely an occasional problem among the affected participants. Of those who reported neck pain, 36.7% (n = 103) experienced it every day. The presence of daily neck pain highlights the chronic nature of the problem and suggests that participants may be exposed to the same contributing occupational factors on a regular basis. Rather than being limited to an acute injury, the repeated occurrence of pain may reflect a pattern of repetitive strain resulting from prolonged static postures, continuous computer use, and inadequate physical breaks. If these contributing factors are not addressed, the symptoms may persist or gradually worsen over time.

Another important finding was related to the duration of workstation use. In the present study, the majority of respondents (54.9%) reported approximately six hours of continuous workstation use per day. Spending such a long period continuously at a workstation represents a significant ergonomic risk factor, particularly when it is accompanied by prolonged sitting and limited changes in posture. Extended computer use can place sustained stress on the neck and upper-body muscles and may contribute to the development or persistence of musculoskeletal symptoms.

Previous studies conducted among office workers have also reported a high prevalence of neck pain and have highlighted the relationship between prolonged computer-based work and musculoskeletal problems⁽⁸⁾. However, specific data regarding the prevalence of neck pain among stock market brokers in Mumbai are limited. This occupational group has unique work demands, including prolonged computer use, sustained static postures, repetitive keyboard activities, high mental stress, and limited physical breaks. Therefore, the present study was undertaken to address this gap and provide information regarding neck pain and associated functional disability among stock market brokers working in Mumbai.

Overall, the findings of the present study demonstrate a considerably high burden of neck pain among stock market brokers aged 30–50 years. The prevalence of 79.2%, together with the finding that 36.7% of affected participants experienced pain on a daily basis, indicates that neck pain is a significant concern in this occupational group. The prolonged use of workstations, with 54.9% of participants reporting approximately six hours of continuous use, further supports the importance of ergonomic and occupational factors. These findings emphasize the need for greater awareness of appropriate working postures, regular physical breaks, and suitable ergonomic practices among stock market brokers to help prevent the persistence and worsening of neck-related problems. This study aims to fill that gap.

According to the Neck Disability Index (NDI) scores, the mean disability among the participants was 25.31%, which falls within the moderate disability range. The majority of the participants, 65.8% (n = 185), were classified as having moderate disability. In comparison, 30.9% of the participants had mild disability, while only 3.2% were found to have severe disability. Notably, none of the participants fell into the “crippled” or “bed-bound” categories.

These findings indicate that although neck pain is highly prevalent among the participants, the associated functional

limitations have not progressed to a debilitating level. The participants may experience difficulty or discomfort while performing everyday activities such as working, reading, and driving; however, the level of disability remains largely within a manageable range. This may indicate an opportunity for early intervention, particularly through physiotherapy management and appropriate ergonomic modifications. Early physiotherapy intervention, combined with correction of workplace-related ergonomic factors, may help manage symptoms, prevent further progression of disability, and maintain functional independence in this population.

The mean age of the participants was between 41 and 50 years, with a greater proportion of participants belonging to the 41–45-year age group. This finding is in line with the general understanding that musculoskeletal complaints tend to become more common with increasing age. The higher occurrence of these complaints may be associated with the cumulative effects of prolonged occupational exposure, along with age-related degenerative changes that can gradually affect the musculoskeletal system.

Neck pain was found to be highly prevalent in both male and female participants, with 80.4% of males and 77.1% of females reporting neck pain. The slightly higher prevalence observed among males may be partly explained by the greater number of male participants included in the study. However, when the severity of functional disability was considered, females had a slightly higher number of severe disability cases (n = 6) compared with males (n = 3). This difference may potentially be related to factors such as variations in workstation setup, differences in pain-coping strategies, multitasking demands, or additional responsibilities related to household work. However, these factors cannot be considered definitive explanations based on the present findings, and further research would be required to determine whether the observed difference reflects gender-specific susceptibility or other contributing factors.

In the present study, 79.2% of the stock brokers (n = 281 out of 355) working in Mumbai reported experiencing neck pain. This represents a notably high prevalence and is comparable to the findings of Wongsirisathawon *et al.* (2019)^[3], who studied broker officers in Bangkok and reported an overall prevalence of musculoskeletal disorders of 78.4% during the previous 7 days and 82.2% during the previous 12 months. The similar prevalence observed in Mumbai (79.2%) and Bangkok (78.4–82.2%) suggests that certain occupational factors may contribute to musculoskeletal problems among stock brokers irrespective of geographical location.

The comparable findings between the two populations may be explained by the common nature of stock broking work, which involves prolonged computer use, predominantly sedentary working conditions, and maintaining static postures for extended periods. These occupational demands may place continuous stress on the musculoskeletal system and increase the likelihood of developing work-related musculoskeletal disorders. The consistency between the findings from Mumbai and Bangkok further indicates that stock broking may represent a high-risk occupation for musculoskeletal disorders across different settings. Both studies highlight the importance of implementing preventive measures to reduce the occurrence and progression of these problems. Wongsirisathawon *et al.* recommended

maintaining correct ergonomic posture, promoting health awareness, and implementing measures aimed at disease prevention. Similarly, the present study recommends regular workstation ergonomic assessments, postural training, neck stretching and strengthening exercises, and the incorporation of regular intermediate breaks during working hours.

When compared with other sedentary occupations, the prevalence of 79.2% observed in the present study can be considered relatively high. This may be related to the particular combination of prolonged screen exposure, limited physical activity, sustained postures, and high levels of psychological stress associated with stock broking. In contrast to occupations involving manual labour, where musculoskeletal pain may commonly result from excessive physical activity or overuse, the discomfort experienced by stock brokers may be more closely associated with physical inactivity, prolonged static positioning, and maintaining the same posture for extended periods. Thus, the findings highlight the importance of addressing both ergonomic and lifestyle-related factors when developing preventive strategies for neck pain among stock brokers.

The findings of the present study indicate that stock broking may be considered a high-risk occupation for the development of neck pain. Although the level of disability observed among the participants was predominantly moderate rather than severe, it still suggests that neck pain is having an impact on their quality of life and ability to perform work-related activities effectively. If these symptoms are left unaddressed, persistent moderate pain may gradually progress and result in more severe functional disability. Therefore, timely preventive measures are important to control symptoms and reduce the likelihood of long-term complications.

Several preventive strategies can be considered for this occupational group. These include maintaining correct posture, providing ergonomic education, incorporating regular stretching, strengthening the neck muscles, and taking short or “mini” breaks at regular intervals during prolonged work. Stress management techniques should also be encouraged, considering the high psychological demands associated with stock broking.

Physiotherapy-led workplace wellness programmes could play an important role in addressing these concerns. Such programmes may help reduce the incidence of neck pain, improve awareness of appropriate workplace practices, and prevent existing symptoms from becoming chronic. A combination of ergonomic education, exercise-based interventions, regular movement breaks, and stress management may therefore be beneficial in promoting the long-term musculoskeletal health of stock market brokers.

Limitations and future directions

This study was informative although rather limited:

- This study was conducted only among stock brokers in Mumbai. Results may not be generalizable to brokers in other cities.
- Self-reported data, cross-sectional so cannot prove causality.
- Male participants outnumbered female participants, which may affect gender-based comparisons.
- Psychological stress and job satisfaction were not measured but may influence neck pain.
- Future research should focus on:

- Future studies can include stock brokers from Navi Mumbai, Thane, and other financial hubs in Maharashtra for comparison.
- Interventional research will help to evaluate the impact of ergonomic training, sit-stand workstations, and physiotherapy sessions on reducing neck pain in Mumbai stock brokers.
- The study highlights the urgent need for workplace ergonomic interventions, health education, and regular health screening for Mumbai stock brokers to reduce neck pain and improve productivity.
- Psychosocial Factors which includes assess job stress, work pressure, and mental health as these are high in Mumbai's stock market environment which may contribute to neck pain progression.
- Study the effect of ergonomic monitoring tools and wearable posture correctors in Mumbai trading offices.

Conclusion

Present study concludes that incidence of neck pain and disability is highly significant among stock market brokers of Bombay Stock Exchange, with 79.15% reporting neck pain and 65.8% experiencing moderate disability. Mean NDI score of 25.31% signifies moderate functional impact. Prolonged computer work in static posture during market hours is a major risk factor. Since disability is clustered in lower-moderate range, early physiotherapy intervention can prevent progression to severe disability. This baseline study provides foundation for policy-level ergonomic reforms at BSE and future interventional research.

Clinical importance

The present study holds significant clinical importance in the field of musculoskeletal physiotherapy and occupational health, as it is the first baseline investigation exploring the incidence of neck pain and disability among stock market brokers of Bombay Stock Exchange [BSE], Mumbai. While extensive research exists on neck pain among IT professionals and general office workers, this high-risk occupational group who work continuously on trading terminals from 9 a.m. to 4 p.m. under high market pressure has remained largely unexplored. With an incidence of 79.15% (n=281 out of 355) and a mean NDI score of 25.31% indicating moderate disability, our findings reveal a silent occupational epidemic that directly affects productivity, decision-making accuracy and quality of life of the backbone of our financial sector.

Clinically, this is important because:

Early, reversible window: Since scores are clustered at 20-25% [median 24%], simple screening with Nordic Questionnaire and NDI can catch cases early before they progress to severe disability [only 3.2% severe at present].

Targeted physio protocol: Prolonged static work of 6-7 hours [54.9% 6 hrs, 44.8% 7 hrs] points to need for ergonomic correction, micro-breaks every 45 min, deep neck flexor and scapular strengthening, and postural training to prevent forward head posture that stresses cervical spine.

Preventive policy: Findings support mandatory ergonomic audits and health education at BSE to reduce absenteeism and financial burden.

Gender consideration: Severe disability more in females [6 vs 3 males] despite male dominance [63.1% male] suggests need for gender-specific assessment.

Overall, it shifts focus from cure to prevention for an economically vital but neglected workforce, and provides baseline for future interventional trials

Abbreviations

MSD: Musculoskeletal Disorder

NPD: Neck Pain Disorder

NDI: Neck Disability Index

NP: Neck Pain

BSE: Bombay Stock Exchange

NSE: National Stock Exchange

SEBI: Securities and Exchange Board of India

MUHS: Maharashtra University of Health Sciences

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