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Impact of neck pain on daily living and work productivity among individuals in rural population

Swati Sharma[1], Jahanvi[1], Dr. Kriti Sachan[2*]
[1] Department of Physiotherapy, Sharda School of Allied Health Sciences, Sharda University, Greater Noida, Uttar Pradesh, India
[2] Assistant Professor, Department of Physiotherapy, Sharda School of Allied Health Sciences, Sharda University, Greater Noida, Uttar Pradesh, India
Corresponding Author: Dr. Kriti Sachan

Abstract
Background: Neck pain is a prevalent condition of the musculoskeletal system that affects individuals of many ages; however, the effect is even worse in rural centers due primarily to the physically demanding nature of work, prolonged positions, limited knowledge regarding ergonomics, and restricted access to healthcare; thus, these contribute to symptoms persisting and worsening in intensity. Neck pain can have a negative influence on activities of daily living (ADLs) and overall work performance, and ultimately economic viability and quality of life.
Methodology: The sample for this study consisted of male and female residents aged between 20 and 60 years residing in rural Nawada, Greater Noida who had been suffering from neck pain for a minimum of 4 weeks prior to their participation in this research project. Participants were asked to provide a comprehensive history about their neck pain, including any limitations they experienced due to neck pain based on their responses to an instrument called the Neck Disability Index (NDI). The participants were also interviewed about how their neck pain was related to their ability to carry out daily activities, including self-care, domestic chores or responsibilities; mobility; and work-related responsibilities.
Result: Moderate to Severe Neck Pain was found to greatly limit an individual's ability to engage in Daily Living Activities such as lifting, overhead work and maintaining postures for a long time. The Personal Productivity of the participants decreased as they reported a lower speed of work, more frequent breaks and having difficulty completing their manual labour. Higher Neck Disability Index scores were related to both ADL limitations and limitations in their Occupation or Work. Many participants said they had little to no Ergonomic Knowledge and continued to work with pain which resulted in worsening of their Symptoms.
Conclusion: Living with neck pain can disrupt an individual's ability to work and perform daily chores. Individuals who work in labour-intensive jobs, live in rural areas without access to trained physiotherapists, and have limited knowledge of ergonomics are at a higher risk of experiencing functional impairments due to neck pain. Community-based education about health issues, the use of proper ergonomics in the workplace, and access to early physiotherapy interventions can help individuals with neck pain mitigate disability, function independently, and improve their work productivity.

Keywords: Neck pain, work productivity, rural population, daily living, neck disability

Introduction

Neck pain is a growing concern for public health and affects both the quality of life and people's work productivity, particularly in rural areas. Neck pain occurs in the cervical area of the neck and can be mild on occasion (intermittent) or it can be severe over time (chronic). This chronic type of neck pain significantly affects an individual's ability to perform activities or remain efficient in their jobs. The Global Burden of Disease study found that between 2020-2050 there will be a 32.5% increase in neck pain incidence worldwide, and although neck pain will occur among all age groups, the prevalence will be greatest among rural communities with limited access to health care services and among those engaged in manual labor and/or informal employment (Mesa Castrillon C.I *et al*., 2024) [8].

Rural populations have higher rates of vulnerability due to their lifestyle habits, such as continuing to engage in extended periods of physical activity (ex: heavy manual labour), not being aware of ergonomic principles, and limiting access to timely medical interventions. In general, studies show that women suffer from neck pain more than men and the burden of this issue tends to increase with age. Additionally, socio-demographic characteristics, inadequate access to healthcare resources, etc. contribute to a greater degree of neck pain in the rural environment (Jing X *et al*., 2021) [3].

Neck pain has an unequal distribution among rural populations. Females and older individuals experience higher rates of neck pain symptoms and severity than their male and younger counterparts because of greater biological susceptibility, as well as less than optimal social or occupational environments that lack ergonomic intervention. For example, 51% of rural elderly individuals report musculoskeletal disorders as being a problem, with most of those individuals working in agricultural or manual labor—particularly females in this segment and individuals over 60 years of age. Without effective education or ergonomic intervention, chronic pain and disability will continue to increase as a result of repetitive trauma, such as performing repetitive motions or lifting heavy items (Machino M. *et al*., 2021) [6].

Neck ache significantly affects your everyday functioning by restricting your ability to move about freely, affecting how well you can sleep at night, and limiting your ability to participate in leisure activities or taking care of yourself properly. Short-term and/or long-term neck Pain can

interfere with how you complete routine chores (i.e., household cleaning, gardening, farming) that are primarily responsible for your income in the countryside. In addition to physical limitations, people who suffer from chronic neck pain often experience decreased quality-of-life, increased stress, and poorer health. Long-term neck pain can disrupt normal sleeping patterns; therefore, you may experience ongoing fatigue throughout the day, have trouble concentrating on tasks, and ultimately be less productive (Kaljic E *et al*., 2022).

Neck discomfort is of financial concern for workers who are unable to safely and/or successfully complete their respective jobs. Moreover, these workers may not receive proper education regarding ergonomic workplace practices or have access to health care for potential neck injuries; therefore, they are at increased risk of injury and long-term pain. In a study conducted during 2024, approximately 16.4% of agricultural workers missed work due to neck discomfort, and only 12% of those workers sought medical attention for their discomfort thus demonstrating that many of these workers face barriers to accessing care in low-resource environments. In addition to financial burden through lost income, these workers place a financial burden on communities due to decreased productivity, aggravating the increase in poverty within these communities. In order to reduce the financial impact of this type of discomfort, workers and employers should explore ways to enhance workers' safety by reducing preventable neck injuries through occupational health measures, ergonomic education, and improved access to health care services (Alhazmi M.H *et al*., 2024) [1].

In order to provide effective public health responses related to the impact of neck pain within rural population, a holistic approach needs to be taken, ensuring response strategies are appropriate for given regions. Responding to rural neck pain will include focus on health system strengthening; equitable resource allocation; development of preventative strategies; education on ergonomics and pain management. In rural areas, it is very important to strengthen the infrastructure of primary care services; provide access to musculoskeletal rehabilitation services; train employees at all workplaces in ergonomic principles to provide long-term benefits. In order to reduce financial burden from out-of-pocket medical expenses for individuals with neck pain and to improve insurance programs such as cooperative health insurance, research shows that reducing the financial burden and increasing the coverage of these programs can reduce both the prevalence of and the effects of neck pain (Chopra A *et al*., 2025) [2].

Review of Literature

Alhazmi M.H *et al*., (2024) [1], evaluated how work performance and life satisfaction are impacted due to mediocre quality of neck pain in a workforce of 371 people who work in an office setting within the Jazan community of Saudi Arabia. They used a survey method with an anonymous self-administered online questionnaire, and analyzed the demographic information as well as neck pain from the Standardized Nordic Questionnaire (NQ) and quality of life from the World Health Organization (WHO) QOL-BREF. Descriptive statistics were utilized to characterise the cohort sampled, while logistic regression was conducted to examine associations between prior neck injury, age, hours of work, and neck pain duration. The results indicated that neck pain experienced by office workers within Jazan has substantial negatively affected work productivity and quality of life. The majority of individuals experienced neck pain at some point will not receive medical attention for problems caused by neck pain, indicating some barrier to accessibility.

Mullerpatan R. *et al*., (2021) [9], undertook a cross-sectional survey of rural tribal populations using standardized questionnaires between August and October of 2016. In particular, spine pain experienced by men and women aged 18 years and older was collected from 2,323 adults (excluding children and adolescents) in six villages in Raigad District. The study found a significant prevalence of spine pain (low back and neck) in rural and tribal areas in India. The authors also noted that beliefs about pain being a "normal part of aging" and practical barriers such as cost and transportation prohibit access to care. Lastly, the authors indicated that the results of the study are important for developing a targeted spinal care program that will engage the community, empower them, and address their real-world constraints.

Castrillon M. *et al*., (2024) [8], conducted a study comparing the prevalence of musculoskeletal pain in different areas of the body (including the back, knee, hip, shoulder, neck, and a combined category of musculoskeletal pain) between rural and urban populations as well as investigating the differences in the way people seek care between these groups. The authors concluded that musculoskeletal pain (particularly in the hip and shoulder) appears to be more common among people living in rural settings than those living in urban settings; however, there were no statistically significant differences between rural and urban populations regarding the prevalence of musculoskeletal pain in other areas (such as the neck, back, or knee) or the ways in which individuals seek care for musculoskeletal pain. Therefore, the authors recommend that public health programs aimed at reducing the burden of musculoskeletal pain should specifically target rural populations due to their differences in patterns of pain and barriers to accessing high-quality, evidence-based treatment.

Jones L.B *et al*., (2024) [4], conducted a study at how various types of exercise affect the intensity of neck pain, level of disability, and quality of life for office workers with chronic neck pain. It has been previously established by earlier reviews that exercise is frequently prescribed for office workers who experience chronic neck pain. However, these earlier reviews primarily focused on interventions that take place in a work environment. Therefore, the goal of this current study was to examine the effectiveness of exercise interventions directly. Eight randomized controlled trials were included in the analysis of this study. Of these eight randomized controlled trials, seven studies showed that individuals who engaged in strength training had a statistically significant decrease in intensity of neck pain (using the Visual Analog Scale (VAS) to measure) following the completion of the strength-training intervention. Five of the eight studies also demonstrated a statistically significant decrease in disability (using the Neck Disability Index (NDI) to measure) after engaging in strength-training interventions. Although one study evaluated the effects of strength training on QoL, it found no statistically significant data regarding this measurement. In summary, there is low certainty that strengthening exercises to the neck, shoulder, and scapular muscles will

reduce the intensity of neck pain and decrease disability in office workers experiencing chronic neck pain.

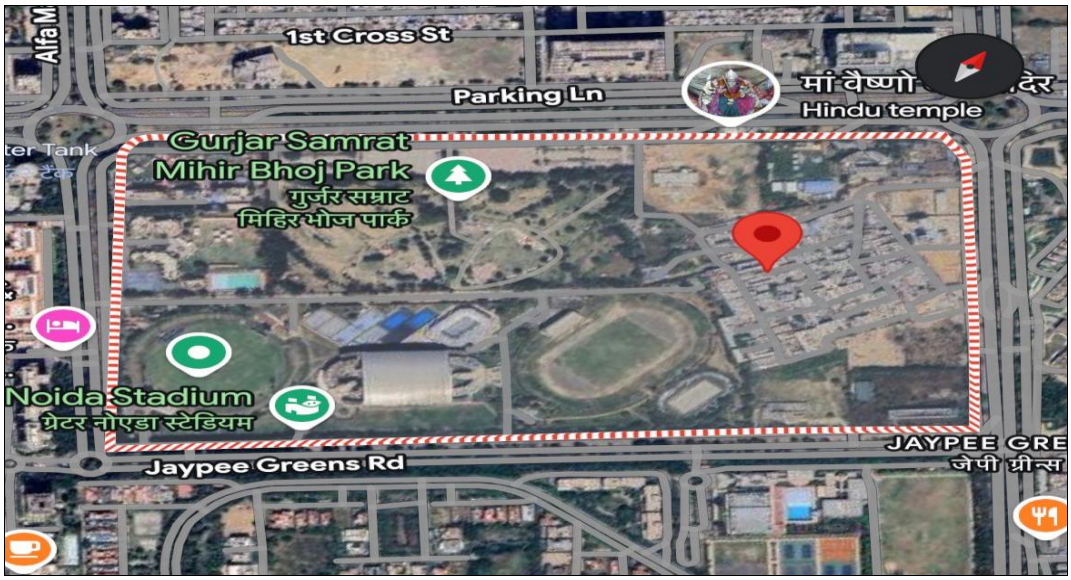
Manotham M *et al*., (2024), a research project was done to see if a community based participatory education program could increase the knowledge, attitude and practice about the prevention of work-related musculoskeletal disorders of rural workers. It was found that many individuals working in rural jobs are often doing motion repetitively, working in awkward positions and doing hard physical work which increases their chances of developing these types of disorders. The intervention tried to improve knowledge on ergonomics, educate participants on working safe with their bodies and develop healthier working habits through hands on training and demonstrations. The results showed large improvements in the participants' knowledge, attitudes and ergonomic behaviours at the conclusion of the program, thus demonstrating that community based participatory education can produce lasting changes in behaviour.

Objectives

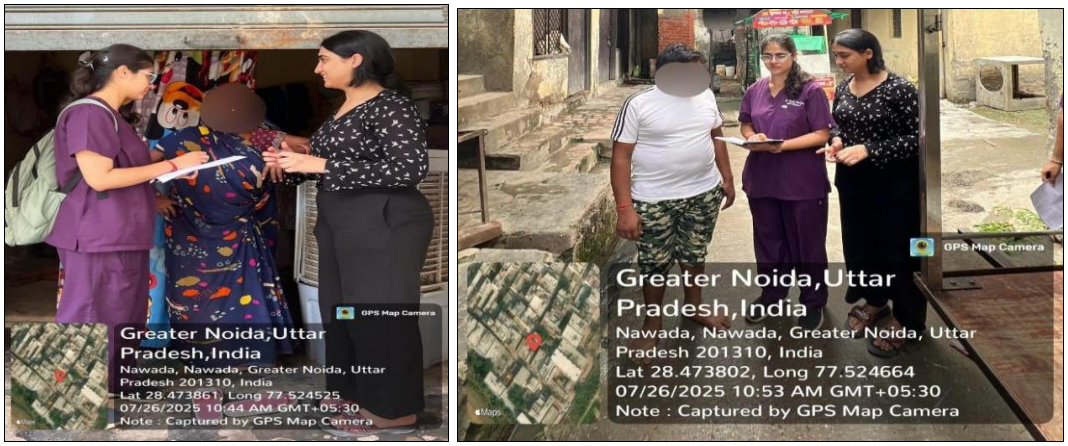
1. To assess the severity of neck pain among individuals living in rural areas.
2. To evaluate the impact of neck pain on activities of daily living among the rural population.
3. To make the community individuals aware about the physiotherapy-based exercises that can enhance their daily life.

Methodology

This study was conducted on Nawada Village, Greater Noida, Uttar Pradesh. A detailed history about the symptom was recorded in a face to face sitting along with Neck Disability Index (NDI) score to know about the severity of the neck pain. The score was recorded in percentage. Participants were informed about the objective of the study and verbal consent was taken. After recording the history and NDI score, awareness was given about the causes, dos, don'ts, management and prevention of the condition. Management included continuous posture correction techniques and physiotherapy-based exercises that can be followed regularly. After two weeks, NDI scores were again taken to know about the effectiveness of the intervention and feedback were taken from the participants.



Map: Village Nawade, Greater Noida, Uttar Pradesh



Proof of Visit

Data Description

Total Participants - 15

The Neck Disability Index (NDI), is a self-reported questionnaire designed to measure neck-specific disability

and assess how neck pain affects a person's daily activities. It consists of ten items covering pain intensity, personal care, lifting, reading, headaches, concentration, work, driving, sleeping, and recreation. Each item is scored on a 6-point scale ranging from 0 (no disability) to 5 (complete disability), with a total possible score of 50. The overall score can also be expressed as a percentage by dividing the total score by 50 and multiplying by 100. Higher scores indicate greater disability.

Table 1: Participants information showing pre- and post-intervention scores of NDI

Serial No.	Age	Gender (M/F)	NDI Total Score (in %)	
			Pre-intervention	**Post-intervention**
1.	42	M	40	26
2.	26	F	50	28
3.	25	F	28	20
4.	31	M	40	28
5.	48	F	32	20
6.	28	M	36	24
7.	39	F	48	32
8.	32	M	52	30
9.	22	F	32	22
10.	38	F	48	38
11.	40	M	40	30
12.	31	M	50	34
13.	42	F	36	20
14.	32	M	52	36
15.	43	F	40	24

Result

Given Data: NDI Total Scores (in %) for 15 participants - recorded Pre-intervention and Post-intervention of participants

Mean (Average) Score: Mean= Sum of all scores / Number

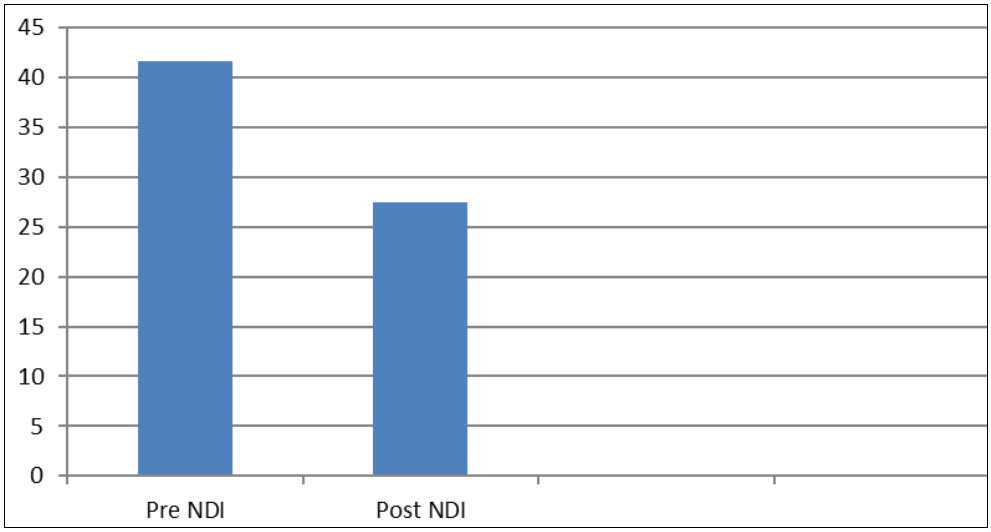
Mean Difference: Mean Pre-intervention score – Mean Post-intervention score

Measure	Calculation	Result
Mean Pre-intervention	624/15	41.6%
Mean Post-intervention	412/15	27.47%

Mean Difference = 41.6 – 27.47 =14.13%

Interpretation

The mean pre-intervention NDI score was 41.6%, while the mean post-intervention score was 27.47%. Thus, there was an average improvement (reduction in disability) of 14.13% after the intervention, indicating a positive treatment effect on neck disability among the participants.



Pre and Post NDI in Percentage

Discussion

This study aimed to determine the effect of upper back pain on the quality of life and productivity of individuals living in rural communities and aid on how to deal with upper back pain through physiotherapy interventions. Fifteen individuals suffering from upper back pain who agreed to participate in the study were included, and the group comprised both males and females. Each individual's Upper

Back Pain Disability Index (UBPDI) score was determined before starting the intervention and after its completion.

The goal of this community-based study was to examine the effect of upper back pain on the quality of life and productivity of adults living in rural areas. The results of this study indicated that many people living in rural areas have upper back pain. This is particularly true for those who are agricultural workers, those who perform household tasks, and those who work in other jobs that are physically demanding. Performing these types of tasks requires sustained periods of bending, lifting, and poor posture, causing strain on the muscles and joints of the upper back.

Many of the individuals in this study experienced difficulty at times completing daily activities, such as cooking, cleaning, farming, or performing general personal care, due to their upper back pain and stiffness. In addition to their difficulty completing daily activities, participants also expressed difficulty concentrating and being effective in their work and thus had reduced productivity. As most rural workers rely on their ability to work physically to earn a living, upper back pain can have an impact on both the individual's income and the quality of their life.

This study demonstrates a need for improved health education and physiotherapy awareness in rural areas. Simple strategies like correcting one's posture, stretching throughout the day, making ergonomic adjustments to work stations, and taking sufficient rest periods between jobs can have a huge impact on either decrease neck pain or enhance performance at work. Promoting these preventative strategies will give residents of rural locations more control over their symptoms in regard to neck pain and can help them avoid experiencing permanent disabilities.

The results of this study show the necessity of early diagnosis and treatment of neck pain for residents living in rural settings. Through the promotion of postural correction, ergonomically adjusting work stations, and performing regular neck-strengthening exercises, rural residents can greatly decrease the functional limitations caused by neck pain on their everyday lives and job performance. Health education and physiotherapy-based education will serve as important resources for helping residents identify hazardous work behaviours, implement corrective measures, and maintain their ability to independently function in their communities.

Conclusion

Recent findings from a community-based study demonstrated a substantial impact of neck pain on the daily function and productivity of those living in rural areas. In these rural jobs, a majority of employees are exposed to situations that are physical and involve repetitive neck movements, such as prolonged physical activity and poor posture. Employees have difficulty accomplishing the goals they set professionally due to discomfort caused by neck pain, resulting in decreased efficiency at work. Poor awareness of prevention or exercise techniques to alleviate or prevent the types of neck pain discussed further exacerbates the problems.

The results of the Neck Disability Index (NDI) identified that many of the participants in this study have difficulty completing many normal activities of daily living independently, including personal care, lifting, sitting or standing for long periods of time, and maintaining their productivity level at work. Moreover, neck pain limits an individual's ability to perform these activities of daily living independently. Furthermore, individuals reported that they also experienced a decrease in productivity, increase in fatigue, and completion of work-related interruptions as a result of their neck pain. This illustrates the impact of neck pain on the individual as well as the weakness of economic stability for a community where working to support oneself or family is dependent upon physically demanding occupations.

Results indicate that it is necessary to have community-level awareness programs related to ergonomics, proper ergonomics, and simple physical therapy exercises. Such programs can reduce pain, promote functional independence, and improve performance at work. By providing early prevention and strategies for self-care, rural communities may be able to maintain better musculoskeletal health and improve the quality of their life.

Summary

This study has taken place in 'Nawada' Village of 'Greater Noida', 'U.P.' The survey was conducted based on the inability of the residents to participate in normal daily activities as a direct result of musculoskeletal issues which were prevalent in the community's population.

After gathering the data from the survey, a selection of 15 people from the community with neck discomfort were chosen to participate. The history of these people's neck pain was taken including when it started, what type of neck pain they had and what caused the pain to worsen. The people were evaluated for the severity of their pain and functional limitation using the "Neck Disability Index". There was a total of five treatment sessions completed over a two-week period.

These educational sessions typically focused on educating the client about their neck pain and why it may occur. It included suggestions for ways to minimize neck discomfort at work (i.e. oceanic pressure being placed on the neck due to working at the computer for long periods). There was also emphasis on maintaining good posture, reducing strain when doing work activities, and incorporating 'neck-friendly' habits into their daily living activities.

The management aspect of these sessions consisted of postural correction and physiologically based exercises to improve strength and flexibility of the neck and the shoulder region. Information gained during these treatment sessions has been demonstrated and reinforced throughout the five treatment sessions of each client.

At the last visit we gathered feedback on the program, and all of the participants were re-evaluated using the NDI for their neck pain. Additionally, community members who attended this workshop indicated that they had obtained greater awareness of their posture, increased comfort in their job, and more motivation to continue their exercises. In conclusion, this study suggests that physiotherapy education and ergonomic awareness delivered in a community-based manner can significantly reduce neck pain and increase quality of life.

According to the conclusions of this study, there is an urgent need to expand physiotherapy awareness and improve access to health education in rural areas. Making community-based preventive strategies available to the rural population for treating neck pain can lead to greater productivity at work, increased ability to carry out daily tasks, and to decrease the long-term health care costs

associated with musculoskeletal disorders within that population.

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