



## CORRELATION BETWEEN NECK AND UPPER LIMB FUNCTIONS IN RAILWAY COOLIES OF AHMEDABAD

### Physiotherapy

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### ABSTRACT

**Background And Need Of Research:** Neck and shoulder are part of upper limb kinematic chain, which strongly suggests that pain in one will lead to disability in other. Moreover, coolies have to walk speedily, cross platform bridges with heavily load as quickly as possible. Such conditions can cause the rate of occurrence of Work-related musculoskeletal disorder (WMSD) like the neck, back, and shoulder pain is high among coolies because of their nature of work. As a result of this, neck pain and shoulder disability should occur in correlation to each other. Hence, to determine the frequency of neck pain Neck Disability Index (NDI) was taken and for level of disability of upper limb (Shoulder Pain & Disability Index SPADI), was used. **Purpose Of Study:** The aim of study is to find correlation between neck and upper limb functions in railway coolies of Ahmedabad. **Methodology:** A study was conducted among 76 males of railway coolies in Ahmedabad city. Verbal consent was taken. Neck functions were recorded by using Gujarati version of NDI and Upper limb functions were recorded by using Gujarati version of SPADI. Data Analysis was done through Statistical Package for Social Sciences (SPSS) version. **Result:** Total 76 males' participants were included. Normality was tested by Shapiro wilk test. Data was not normally distributed, so the Spearman rank correlation test was used. Significance level was kept at  $P \leq 0.05$ . correlation coefficient (r) between scores of NDI and SPADI was 0.636 and p value was 0.000. Result suggests that scores of NDI have moderate significant positive correlation with score of SPADI. **Conclusion:** Conclusion of a study is that neck pain can lead to pain and functional limitations of upper limb and vice versa in coolies.

### KEYWORDS

Coolies, Neck Pain, SPADI (Shoulder Pain & Disability Index), NDI (Neck Disability Index)

### INTRODUCTION

Coolie is one of the oldest occupations in India. This occupational group is continuously subjected to various musculoskeletal problems due to repetitive load exertion in unnatural postures.<sup>[1]</sup> However, this problem has not received significant attention from researchers, and the exact causes are poorly understood.

Musculoskeletal disorders (MSDs) associated to work consists of conditions such as pain, inflammation, tingling, and numbness involving tendons, muscles, nerves, cartilage, ligaments, and joints. Often associated to or aggravated by the work, these disorders or injuries are termed as work-related musculoskeletal disorders (WMSDs)<sup>[2]</sup>. The most significant risk factors associated with such tasks are (a)repetitive motions (frequent lifting/carrying of loads), (b)forceful exertions (lifting/carrying of heavy loads), (c)awkward postures (bending/twisting), (d)accumulated pressure points with sharp-edged loads, and (e)static postures for extended periods. Repeated or persistent exposure to any of these risk factors may cause acute discomfort and weariness. The risk level is often determined by a worker's exposure duration, frequency, and intensity to risk variables. Workers become more prone to neck, shoulder, back, wrist, hand, and other body component problems over time. Numerous studies carried out in the past revealed a strong relation between work related tasks demanding forceful arm efforts and the rate of neck disorders.<sup>[3,4]</sup>

Irrespective of this, work-related pain in shoulder occurs frequently in many occupations requiring heavy muscular load, such as construction workers<sup>[5]</sup>, platers<sup>[6]</sup>, and welders<sup>[7]</sup>. So, work demands of people who work in physically demanding jobs like coolies are required to perform extended periods of pulling, pushing, lifting, carrying weight overhead, picking-up, bending, tugging etc. Which may lead to various musculoskeletal disorders especially focusing in and around neck and shoulder. Thus, leading to difficulty in fulfilling their vocational activities.

Above mentioned question can be checked by correlating the neck dysfunction will affect upper limb functions. This was assessed by standardized questionnaire for neck disability - Neck Disability Index (NDI) and for addressing upper limb functions - Shoulder Pain & Disability Index (SPADI) was used.

**Neck Disability Index (NDI):** Patient-completed, condition-specific functional status questionnaire with 10 items including pain, personal care, lifting, reading, headaches, concentration, work, driving, sleeping and recreation. Each section is scored on a 0 to 5 rating scale,

in which zero means 'No pain' and 5 means 'Worst imaginable pain'. Points summed to a total score. The test can be interpreted as a raw score, with a maximum score of 50, or as a percentage. 0 points or 0% means : no activity limitations ,50 points or 100% means complete activity limitation. A higher score indicates more patient-rated disability. The NDI has a fair to moderate test-retest reliability.<sup>[8]</sup>

**Shoulder Pain & Disability Index (SPADI) :**The questionnaire comprised of demographics and questions about shoulder pain and disability. The pain dimension consisted of five questions regarding the severity of an individual's pain. Pain where: 0 = no pain and 10 = the worst pain imaginable. Shoulder disability was assessed with eight questions related to various activities of daily living that require upper-extremity use. Disability scale described where: 0 = no difficulty and 10 = so difficult it requires help. Overall scores ranged from 0 to 130 with a percentage of 0 suggesting less shoulder disabilities and 100 implying more shoulder dysfunctions.<sup>[9]</sup>

### Methodology

#### Study design:

It is a correlation study conducted after receiving approval from the institutional ethical committee

#### Setting:

The study was conducted in the Kalupur Railway Station Ahmedabad

#### Participants:

##### Inclusion Criteria:

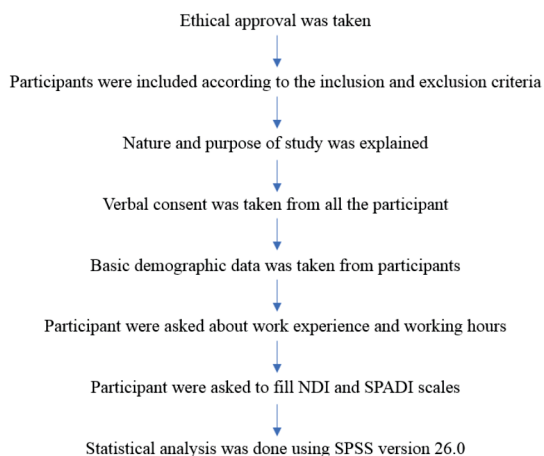
Total 76 participants were selected according to selection criteria. As per inclusion criteria individual should be more than 25 year of age, only male participant were included, individuals who are able to read Gujarati language.

##### Exclusion Criteria:

Any history of trauma around neck or shoulder in last 1 year, any neck or shoulder surgery within 1 year were excluded.

#### Procedure

Permission for Gujarati version of the SPADI and NDI scales were taken from authors. Participants were selected according to inclusion criteria. Then, nature & purpose of study were explained to each and every participant. After verbal consent following information was taken - Basic demographic data, work experience and total working hours. Then, self-reported outcome measure score were recorded using Gujarati version of SPADI and NDI scale .

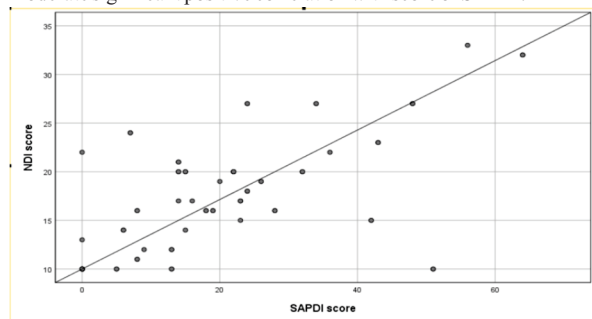
**Flow chart****Statistical Analysis**

Data were analyzed using the statistical package (SPSS) version 26.0. Total 76 male participants were included. Shapiro-Wilk test was used for normality. Data was not normally distributed, so the spearman rank correlation test was used. Significance level was kept at  $p \leq 0.05$ . Mean  $\pm$  SD of age was  $(43.34 \pm 12.10)$ , Work experience  $(21.21 \pm 12.54)$  years, working hours  $(10.02 \pm 2.42)$  hours, NDI score  $(17.07 \pm 6.17)$ , SPADI  $(19.36 \pm 16.6)$ .

**Table 1: Descriptive Characteristics of Coolies**

| Characteristics    | MEAN $\pm$ SD     |
|--------------------|-------------------|
| Age                | 43.34 $\pm$ 12.10 |
| Working experience | 21.21 $\pm$ 12.54 |
| Working hours      | 10.02 $\pm$ 2.42  |
| NDI Score          | 17.07 $\pm$ 6.17  |
| SPADI score        | 19.36 $\pm$ 16.6  |

Correlation coefficient (r) between scores of NDI and SPADI was 0.636 and p value was 0.000. Result suggests that scores of NDI have moderate significant positive correlation with score of SPADI.

**Graph 1: Correlation between NDI and SPADI in Coolies****DISCUSSION**

This study demonstrated a positive moderated correlation between neck pain and upper limb function in coolies of Ahmedabad. Neck pain is a common musculoskeletal problem which affects a substantial proportion of people at some point in their lives. It has long been recognized that neck pain can result in symptoms and problems being referred into the upper limb which report problems with upper limb function. Any kind of mechanical loading to the articular and ligamentous structures of neck can result into increase in mechanical loading of upper limb.<sup>[10]</sup> As coolies work with heavy weight lifting holding with their hand on head so they face various musculoskeletal issues at work place. This causes upper limb pain and difficulty doing upper limb activities, which may prevent coolies from utilizing their upper limb, resulting in upper limb disability. This will result in upper limb muscle weakness, causing coolies to struggle with upper limb movements and functions, ultimately leading to upper limb impairments or a vice versa.

**CONCLUSION**

Conclusion of this study is that neck pain can lead to pain and functional limitations of upper limb or vice versa in coolies.

**Clinical Implication**

Ergonomic advice should be given to prevent future damage by performing proper exercises for relieving pain and thus improving work efficiency.

**Limitation**

- Small sample size
- The Data was not homogeneously distributed.

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