

# Prevalence of Musculoskeletal Disorders in Diamond Workers: A Survey in Ahmedabad City

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**Abstract:** *Background:* Work related musculoskeletal disorders are significant and costly workplace problems affecting productivity, longevity of occupation and the health of the working population. Diamond workers have an increased risk of developing such disorders. There is paucity of research in identifying the common musculoskeletal disorders amongst Diamond workers. It is therefore necessary to find out the musculoskeletal problems in each specialty area. So that necessary precautions can be taken to prevent and manage them. *Objectives:* a.) To find out the prevalence of musculoskeletal disorders in reference to age among the diamond workers in Ahmedabad. b.) To find out the prevalence of musculoskeletal disorders in reference to BMI among the diamond workers in Ahmedabad. c.) To find out the prevalence of musculoskeletal disorders in reference to body segments among the diamond workers in Ahmedabad. d.) To find out the prevalence of musculoskeletal disorders in reference to year of experience among the diamond workers in Ahmedabad. *Hypothesis:* H<sub>0</sub>: There is no significant association between WMSD & selected demographic variables of Diamond workers. H<sub>1</sub>: There is a significant association between WMSD & selected demographic variables of Diamond workers. *Study design:* Descriptive Observational Study. *Methodology:* Random sampling technique will be adopted with 300 participants. *Outcome measures:* Standardised Nordic questionnaire. *Method of Data Analysis:* The data analysis will be done by using descriptive & inferential statistics.

**Keywords:** WMSD, Diamond Workers, Standardised Nordic questionnaire

## 1. Introduction

Musculoskeletal disorders (MSDs) are described as disorders of the muscles, nerves, tendons, ligaments, joints, cartilage, or spinal discs. The term “work-related musculoskeletal disorders” (WMSDs) refers to MSDs that are made worse or long lasting by work conditions. MSDs are some of the most important work-related problems currently reported.<sup>1</sup>

WMSDs are reported to significantly impact quality of life, cause loss of work time or absenteeism, increase work restriction, transfer to another job, or disability than any other group of diseases with a considerable economic toll on the individual, the organization and the society as a whole.<sup>2</sup>

A number of intrinsic and extrinsic factors have been implicated in the aetiology of WMSDs. Silverstein et al reported repetitive movement, awkward postures, and high force levels as the three primary risk factors that have been associated with WMSDs.<sup>3</sup>

Work related musculoskeletal disorders (WMSDs) can be sub divided into the more specific and recognized body regions of the back, upper limbs and lower limb disorders. These sub categories when combined, form the overall grouping values presented in this document for the general classification of MSD illness type. Work related disorders can develop in an occupational setting due to the physical tasks with which individuals carry out their normal work activities.<sup>4</sup>

Musculoskeletal disorders (MSDs) are widespread in many countries, with substantial costs and impact on quality of life. Although not uniquely caused by work, they constitute a major proportion of all registered and/or compensable work-related diseases in many countries.<sup>5</sup>

MSDs occur in certain industries and occupations with rates up to three or four times higher than the overall frequency. High-risk sectors include nursing facilities; air transportation; mining; food processing; leather tanning; and heavy and light manufacturing (vehicles, furniture, appliances, electrical and electronic products, textiles, apparel and shoes).<sup>5</sup>

Upper extremity musculoskeletal disorders are also highly prevalent in manual-intensive occupations, such as clerical work, postal service, cleaning, industrial inspection and packaging.<sup>6</sup> Back and lower limb disorders occur disproportionately among truck drivers, warehouse workers, airplane baggage handlers, construction trades, nurses, nursing aides and other patient-care workers, and operators of cranes and other large vehicles.<sup>7</sup>

The latest estimates from the Labour Force Survey (2016) show that in Great Britain, The total number of WRMSDs cases (prevalence) in 2015/16 was 539,000 out of a total of 1,311,000 for all work related illnesses, 41% of the total.<sup>8</sup>

MSD is the largest single cause of work related illness, accounting for over 33% of all newly reported occupational illness in general population.<sup>9</sup>

In industrial workers of DELHI have obtained a 59.4% prevalence of MSD.<sup>10</sup>

## 2. Materials and Methods

Study design: Descriptive Observational Study.

Population: Diamond Workers.

Sampling technique: Random sampling technique will be adopted.

Sample and sample size: 300 Diamond Workers.

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Sampling Criteria:

**I. Inclusion criteria**

- Subjects who willing to participate in study.
- Age group of: 25-58years.
- Work experience: 10-30 years.
- Working hrs 8-12hrs/day.

**II. Exclusion criteria**

- Subjects with any other associated cardiovascular, neurological, Systemic disorders (diabetes mellitus, hyper tension).
- Congenital and acquired deformities.
- Any acute MSK disorders.

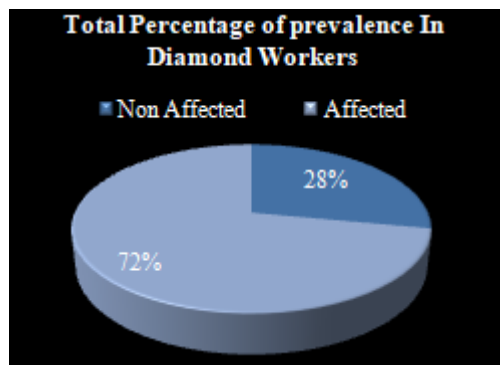
**Outcome Measures:** Standardised Nordic questionnaire.

**Procedure**

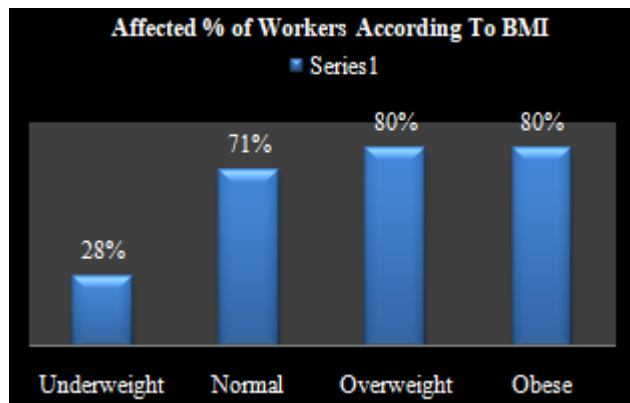
300 Diamond Workers were conveniently selected from Ahmadabad. Informed consent was obtained from them. They were given self-administered questionnaires & WMSD were measured by Standardised Nordic questionnaire. The confidentiality was maintained. Standardised Nordic questionnaire a general questionnaire of 40 forced-choice items identifying areas of the body causing musculoskeletal problems. Completion is aided by a body map to indicate nine symptom sites being neck, shoulders, upper back, elbows, low back, wrist/hands, hips/thighs, knees and ankles/feet. Respondents are asked if they have had any musculoskeletal trouble in the last 12 months and last 7 days which has prevented normal activity was taken and the Diamond workers has to answer accordingly, not just how they feels today only. we have made them understand the scale and translated in the language which was convenient for them, so that we can get reliable data.

**3. Result**

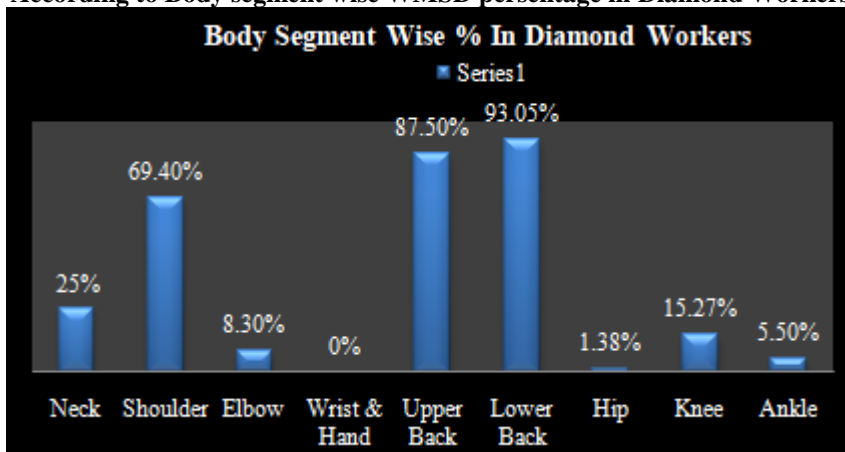
**Total 300 diamond workers taken and Total Percentage of prevalence in Diamond Workers**



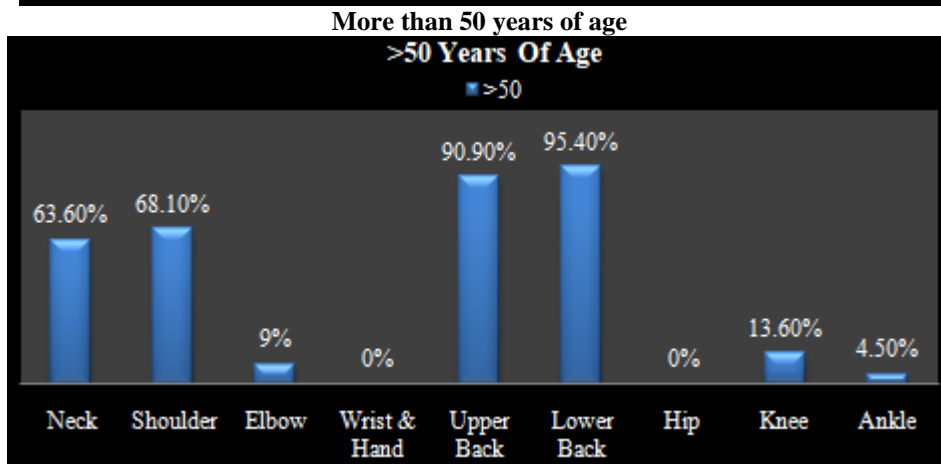
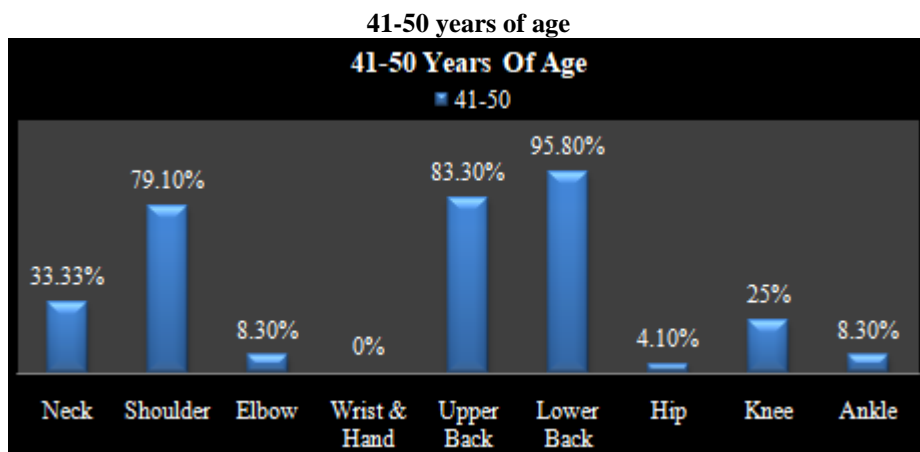
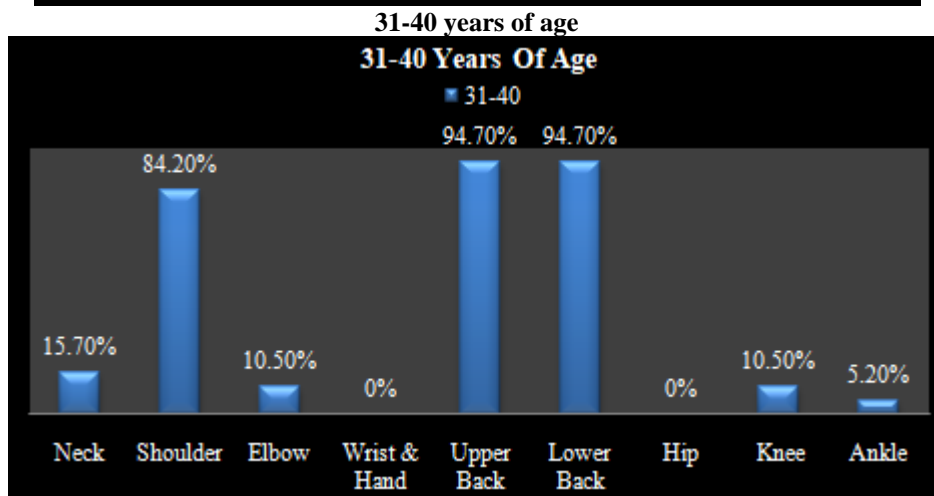
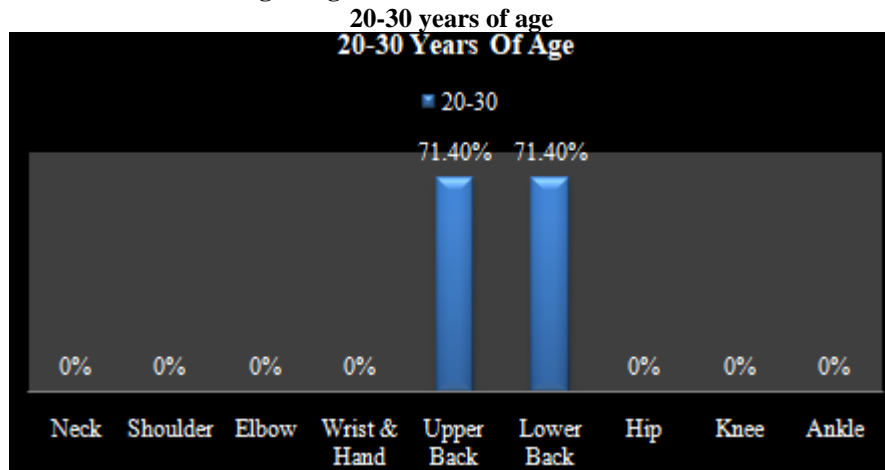
**Affected percentage of Workers according To BMI**



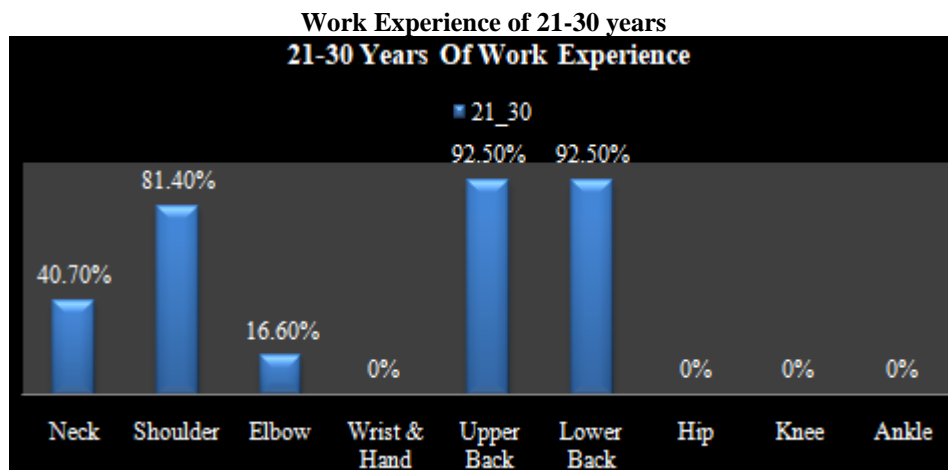
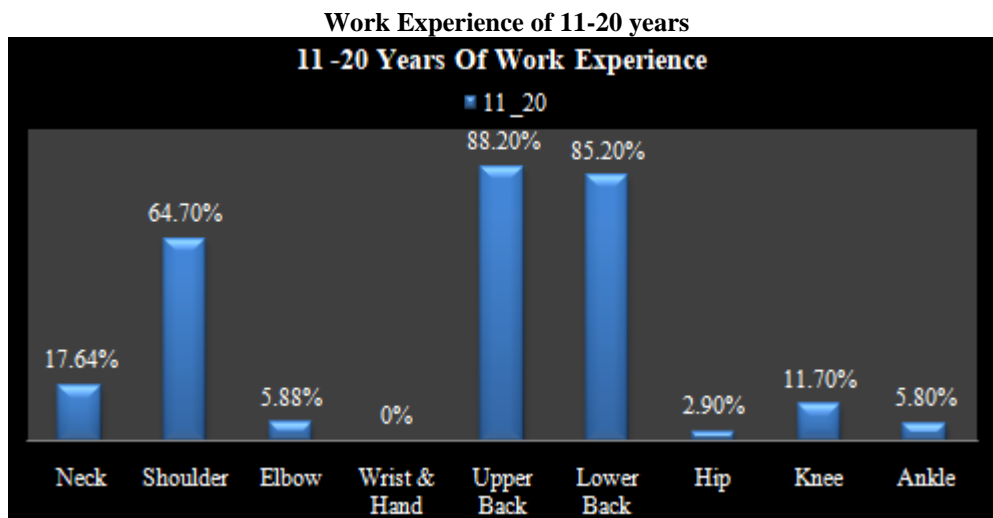
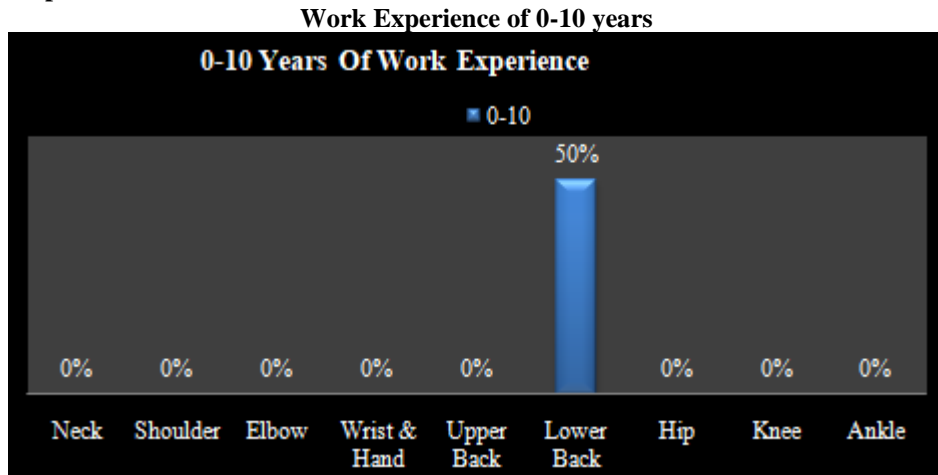
**According to Body segment wise WMSD percentage in Diamond Workers**

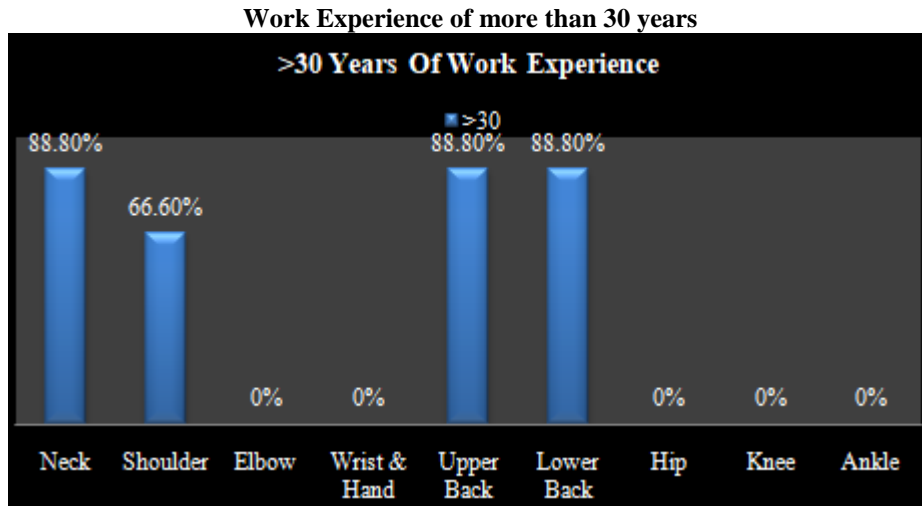


According to Age wise WMSD in Diamond Workers



According to work experience wise





#### 4. Discussion

Sustaining any static posture, such as sitting, increases the demand on the muscles, ligaments, and other soft tissues of the musculoskeletal system. It is not surprising then that overall discomfort and pain in the back, neck, and shoulders are common symptoms reported by workers who sit for most of their workday.

Sitting alters the normal curvature of the spine and puts pressure on the discs. With prolonged sitting this pressure can cause compression of the discs. These resulting chronic back pain and possible nerve damage can impact on workers ability.(Tirthankar ghosh et al)

Diamond workers are engaged in prolonged forward bending posture in there working condition. The amount and quality of forward-bent posture and the techniques of work influence the compressive force on the vertebral discs. (Chaffin and Anderson et al)

The workers by adopting awkward posture at work, most often suffer from MSDs particularly affecting the low back region as In this study we find that work related to MSDs like pain in low back(93.5%).

The association between the cumulative nature of these injuries and an outcome of MSD is further strengthened by the significant associations between the length of the job and the number of working hours.(Bernard BP et al)

Increasing age is significant for an outcome of MSD in the current study. The role of age in the outcome of MSD has also been reported by Holmstrom et al.

#### 5. Conclusion

The prevalence of MSD in diamond workers is 72% and among them lower back is more prone to affect followed by upper back, shoulder, neck and other joints. There is strong positive relationship between Age , Work Experience and BMI with the WRMSD.

#### Clinical Application

By teaching proper ergonomic modification and exercises to the diamond workers WRMSDs can prevented. We can improve productivity of diamond industry and increase staff well being.

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