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# Prevalence of Altered Grip Strength in Weavers

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## Abstract

**Aim:** To find out the prevalence of altered grip strength in weavers. **Materials and Methodology:** The survey was conducted in Karad. Weavers were selected randomly and were included in this study if they were working for nearly about more than five hours per day. Subjects with any hand injury, fracture, any cervical conditions were excluded as they will have decreased grip strength also people of older age were not selected for the study as grip strength decreases with age. After selecting the participants were told about the study procedure and its importance. Participants were selected willingly. Then the range of motion of the wrist joint was measured using a goniometer of both hands. After measuring the ranges grip strength was measured using a sphygmomanometer by asking the subject to squeeze the cuff of the sphygmomanometer which shows pressure applied by the subject. Both working and non-working hands were assessed for ranges and grip strength. Measurements were noted accordingly. **Conclusion:** This study concluded that the pincer grip of the working hand was affected more than the cylindrical one. While the cylindrical grip of the working hand was not affected. According to the study pincer grip in weavers is affected more than cylindrical grip of working hand. Workers working for more than 5 years are usually seen to have altered grip strength.

**Keywords:** Pincer and Cylindrical Grip, Weavers, Working and Non-Working Hand

## 1. Introduction

Weaving plays an important role even today in the socioeconomic status of weavers in India. Weaving with hand for more than 5-6 hours may result in fatigue of a particular muscle group. Musculoskeletal disorders are very common in various industrial workers, and workers from handloom industries are one of them. These musculoskeletal disorders are mostly caused due to repetitive force, repetitive actions, prolonged working hours, and no or limited resting hours between the working periods. Grip strength is the strength of the muscles of the hand while gripping the object[1,2]. Musculoskeletal injuries mostly affect the ligaments, tendons, muscles, nerves etc[3-5]. Grip strength is normally affected in old age and also in women when compared to men[6]. Grip strength is very important in indicating upper limb impairments.[7] Occupation is a very important factor for grip strength in many people[8]. Grip strength is also the predictor of good muscle strength and endurance[9]. Grip strength is associated with various other medical conditions. There is long-time use of flexor muscles of the forearm during the weaving process[10]. Prolonged use of muscles may lead them to fatigue, which is because of reduced blood supply to that part which in turn will result in an increase in the amount of lactic acid. So proper grip assessment is necessary as it will help the clinician to provide proper treatment protocol. Grip assessment is mostly done with the help of a handheld dynamometer which is a device that measures the hand grip. Hand grip can be affected in old age, after hand surgery, etc,

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physiotherapy exercises are also very helpful in increasing grip strength[11]. Muscle strengthening exercises are very important in gaining muscle force. Ball squeezing, rubber exercises, and Muscle energy techniques are some of the common treatments used to increase grip strength[12]. Along with strengthening exercises stretching and flexibility exercises can also be useful in the reduction of musculoskeletal disorders. In this study the weavers will be assessed for their grip strength here we have used a sphygmomanometer for checking strength and also range of motion of the wrist joint was taken with the help of a goniometer. Both the working and non-working hands were assessed for comparison purposes. And the prevalence was taken according to the results.

## 2. Materials and Methodology

The study was conducted at Krishna College of Physiotherapy 30 participants participated in subjects working for more than 5years were selected. Ranges of the wrist were measured with a goniometer and with a sphygmomanometer grip strength was measured.

## 3. Material used

Sphygmomanometer, goniometer.

## 4. Result/ Findings

### 4.1 Outcome Measures

Range of motion, grip strength.

**Table 1.** Mean values of flexion of both working and non-working hands

| Flexion | Working hand | Non-working hand |
|---|---|---|
| Mean ± SD | 62.167 ± 11.329 | 64 ± 10.267 |
| P value | <0.0001 | <0.0001 |
| T value | 30.055 | 34.461 |

**Table 2.** Mean values of extension of both working and non-working hand

| Extension | Working hand | Non-working hand |
|---|---|---|
| Mean ± SD | 62.67 ± 9.079 | 65.233 ± 5.463 |
| P value | <0.0001 | <0.0001 |
| T value | 37.804 | 65.408 |

**Table 3.** Mean values of radial deviation of both working and non-working hand

| Radial deviation | Working hand | Non-working hand |
|---|---|---|
| Mean ± SD | 18.5 ± 2.345 | 19.3 ± 1.784 |
| P value | <0.0001 | <0.0001 |
| T value | 43.207 | 59.254 |

**Table 4.** Mean values of ulnar deviation of both working and non-working hand

| Ulnar deviation | Working hand | Non-working hand |
|---|---|---|
| Mean ± SD | 28.83 ± 2.743 | 29.33 ± 2.426 |
| P value | <0.0001 | <0.0001 |
| T value | 57.578 | 66.229 |

**Table 5.** Mean value of cylindrical grip of both working and non-working hand

| Cylindrical grip | Working hand | Non-working hand |
|---|---|---|
| Mean ± SD | 145.53 ± 68.216 | 130.86 ± 65.44 |
| P value | <0.0001 | <0.0001 |
| T value | 11.685 | 10.953 |

**Table 6.** Mean value of pincer grip of both working and non-working hand

| Pincer grip | Working hand | Non-working hand |
|---|---|---|
| Mean ± SD | 50.467 ± 20.424 | 58.33 ± 20.246 |
| P value | <0.0001 | <0.0001 |
| T value | 13.534 | 15.853 |

## 5. Discussion

A study was conducted to find out the prevalence of altered grip strength in weavers. To find out how repetitive motion and prolonged working of weavers affect their grip strength previous study mentioned how grip strength is affected according to BMI, joint position, age, and many other factors study was conducted in the age group 20-50 years.

The ethical certificate was obtained by the Krishna Institute of Medical Sciences, study was conducted at Krishna College of Physiotherapy. Subjects were selected according to inclusion and exclusion criteria. Measurement of wrist Range of Motion was taken with the help of a goniometer also grip strength was measured with the help of a sphygmomanometer .30 subjects were selected for the study. There was a major decrease in the

pincer grip of the working hand. There was not much alteration in the cylindrical grip of the working hand.

## 6. Conclusion

This study concluded that the pincer grip of the working hand was affected more than the cylindrical one. While the cylindrical grip of the working hand was not affected. According to the study pincer grip in weavers is more affected than cylindrical grip of working hand. Workers working for more than 5 years are usually seen to have altered grip strength. The pincer grip was affected by the working hand when compared with the non-working hand. While the cylindrical grip was not affected by the working hand.

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