Comparison of Hand Grip Strength Among Chefs and Non-Chefs

Fatima Mazhar, Fareeha Amjad, Ashfaq Ahmad

University of Lahore, Lahore Pakistan

ABSTRACT

Objective: To compare the handgrip strength among chefs and non–chefs.
Study Design: Comparative cross-sectional study.
Place and Duration of Study: Different restaurants and hotels of Lahore, from Apr to Sep 2018.
Methodology: Thirty-one chefs and 31 non-chefs (waiters and managers) were included in the study. We used a standard method for measuring the handgrip strength of the dominant and non-dominant hand. Handgrip strength was measured with the help of an electronic hand dynamometer (Model EH101).
Results: The mean handgrip strength of the dominant hand of the chefs was 39.90 ± 8.50 kg, with the range 22.76 kg-55.30 kg, whereas among non-chefs, the mean handgrip strength of the dominant hand was 38.54 ± 7.85 kg, with the range 21.06 kg-52.86 kg. The mean handgrip strength of the non-dominant hand of the chefs was 38.36 ± 7.97 kg, with the range 24.20 kg-56.66 kg, whereas, among non-chefs, the mean handgrip strength of non-dominant hand was 37.15 ± 7.26 kg, with the range 23.03 kg-51.60 kg.
Conclusion: Handgrip strength of chefs and non-chefs was the same in the dominant and non-dominant hands. There was no significant statistical difference in the handgrip strength among chefs and non-chefs.

Keywords: Dominant hand**,** Handgrip strength, Muscle strength dynamometer.

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INTRODUCTION

The strength of handgrip estimation is important in deciding the effectiveness of the treatment plan and hand recovery. This strength is the consequence of intentional flexion of the fingers by a person under ordinary conditions.[1] Handgrip strength (HGS) is responsible for activities of daily living and indirectly measure the motor skills of hand.[2] Dynamometer measures handgrip strength in kilograms and pounds. 90kg (200 Ib) is considered as maximum strength.[3,4] Hand-grip strength (HGS) estimates the muscular power of the hand and forearm.[5,6]

Limited previous research has been conducted to compare and measure the HGS among chefs and non-chefs.[7] Chefs repetitively use their dominant hand for cooking, grasping, cutting and holding.[8,9] Non-chefs do not use their dominant hand as frequent as used by chefs. This study was planned to compare the handgrip strength of chefs and non-chefs.

METHODOLOGY

This was a comparative cross-sectional study, conducted from April to September 2018. Data was collected from different restaurants and hotels in Lahore. Ethical approval was taken before the start of data collection (IRB no.: IRB-UOL-FAHS/517/2019). The total study sample was 62. The sample size was calculated with the help of Epitool sample size calculator 10. There were 31 chefs and 31 non-chefs included in the study. Non-probability consecutive sampling was used for data collection purpose.

Inclusion Criteria: Male chefs and non-chefs (waiters and managers) with the age range of 20-50 years, were included in the study.

Exclusion Criteria: Individuals with hand trauma, fracture or recent surgery of the hand (a few days earlier), metabolic diseases, chronic illness of hand and recent recovery from stroke were excluded from the study.

Data from chefs was collected from different restaurants and hotels of Lahore and non-chefs were individuals working there as waiters managers. Informed consent was taken from all the participants.

After getting demographical information, the researchers measured the handgrip strength of chefs and non–chefs with the help of a Camry electronic hand dynamometer (Model EH101) (Figure-1). The handgrip strength was measured in sitting position with shoulders in neutral position, elbow at an angle of

Correspondence: Dr Fatima Mazhar, Department Physical Therapy, University of Lahore, Lahore Pakistan
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90°, forearm mid prone and wrist in ulnar deviation (Figure-2).

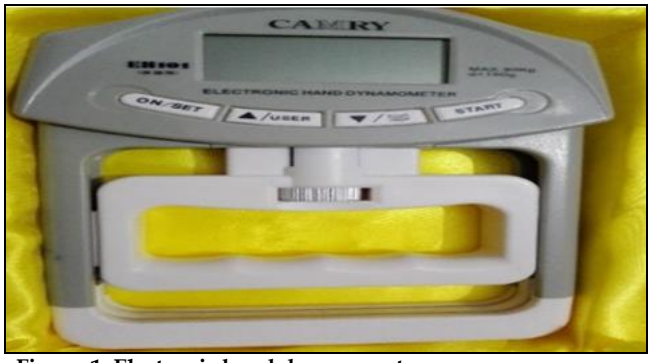

Figure-1: Electronic hand dynamometer.

Figure-2: Handgrip strength measurement position.

The researchers then set the age and gender on an electronic dynamometer according to the individual and asked the individual to squeeze the handle of the dynamometer with more effort for 3 seconds. Three readings of the dominant hand and non-dominant hand were taken then the mean of three readings was calculated. After taking one reading, two- minutes rest interval was added to avoid the fatigue factor.

Statistical Package for Social Sciences (SPSS) version 21.0 was used for the data analysis. Quantitative variables were summarized as mean ± SD and qualitative variables were summarized as frequency and percentages. Independent sample t-test was applied to find the mean differences among the groups. The *p*-value of ≤0.05 was considered statistically significant.

RESULTS

There were 62 participants included in the study (31 chefs and 31 non-chefs). Thirty-one (100%) chefs were right-handed, whereas, among non-chefs, there were 30 (96.8%) right-handed while only 1(3.2%) individual was left-handed. The mean handgrip strength of the dominant hand of the chefs was 39.90 ± 8.50 kg, with the range 22.76 kg-55.30 kg, whereas among non-chefs, the mean handgrip strength of the dominant hand was 38.54 ± 7.85 kg, with the range 21.06 kg - 52.86 kg.

The mean handgrip strength of the non-dominant hand of the chefs was 38.36 ± 7.97 kg, with the range 24.20 kg-56.66 kg, whereas, among non-chefs, the mean handgrip strength of non-dominant hand was 37.15 ± 7.26 kg, with the range 23.03 kg-51.60 kg (Table-I).

An independent sample t-test was applied for the comparison between two groups. There was no significant difference in the grip strength of chefs and non-chefs (*p*-value: 0.515 and 0.536 respectively) as shown the Table-II.

Table-I: Descriptive statistics of age, weight, height and hand grip strength of dominant and non-dominant hand among chefs and non-chefs.

Occupation	Total Number	Study Variables	Mean ± SD (Range)
Chefs	31	Age (year)	32.94 ± 8.20 (21-48)
Non-Chefs	31	Age(year)	39.35 ± 7.48 (21-48)
Chefs	31	Weight (kg)	68.00 ± 10.20 (45-87)
Non-chefs	31	Weight(kg)	71.13 ± 13.96 (54-113)
Chefs	31	Height (cm)	164.93 ± 11.85 (144.78-190.50)
Non-chefs	31	Height(cm)	165.18 ± 14.22 (134.62-213.36)
Chefs	31	Hand grip strength of dominant hand (kg)	39.90 ± 8.50 (22.76-55.30)
Non-chefs	31	Hand grip strength of dominant hand(kg)	38.54 ± 7.85 (21.06-52.86)
Chefs	31	Hand grip strength of non-dominant hand(kg)	38.36 ± 7.97 (24.20-56.66)
Non-chefs	31	Hand grip strength of non-dominant hand(kg)	37.15 ± 7.26 (23.03-51.60)

Table-II: Comparison of hand grip strength of dominant and non-dominant hand among Chefs and Non-Chefs (n=62).

Parameters	Occupation	Mean ± SD	*p*-value
Hand grip strength of dominant hand	Chefs n=31	39.90 ± 8.50	0.515
	non- chefs n=31	38.54 ± 7.85	
Hand grip strength of non-dominant hand	Chefs n=31	38.36 ± 7.97	0.536
	non- chefs n=31	37.15 ± 7.26	

DISCUSSION

Handgrip strength of chefs and non-chefs was found to be the same in the dominant and non-dominant hands in our study. There was no significant statistical difference in the handgrip strength among chefs and non-chefs.

Determination of handgrip strength influences a treatment programme and improvement of hand.[11,12] Handgrip strength (HGS) indirectly measure muscle work and fitness of the body. [13,14]

Sims *et al,* compared handgrip strength among musicians and non-musicians. A significant difference was found in mean values of grip strength. Musicians had less handgrip strength than non-musicians in their study. Handgrip strength of both hands was less in male musicians, but in female musicians, grip strength was found less only in the frequently used-hand.[11] On the contrary, in the present study, the strength of chefs was compared with non–chefs. There was no significant statistical difference in the grip strength among chefs and non-chefs. The handgrip strength of the dominant hand and non–dominant hand was the same in both groups.

Kamarul *et al,* concluded that strength of the dominant hand was more than the non-dominant hand. Male had more strength as compared to females.[12]

Incel *et al*, compared the handgrip strength in those who use the right hand more and those who use the left hand more. Right-handed people had the high handgrip strength of the right hand than the left hand, and left-handed people had no such difference.[13] The present study did not determine the strength of right and left-handed people.

Previous studies concluded that age, weight, height, hand area and lower arm boundary were related to hand-holding quality. As age increases, handgrip strength is decreased.[15] Hand grip strength estimation is imperative in determining the efficacy of treatment strategies and hand rehabilitation.[16,17] This strength is the result of a maximum voluntary forceful flexion of the fingers by an individual under normal conditions. Grip strength is crucial for the human body while performing prehensile and precision hand functions. The human hand is a complex structure tailored to the functions of manipulation, and the hand conveys sensory information to brain about temperature, form and texture of the objects it controls. Grip strength has been studied as a predictor of general health, heart disease, cerebrovascular disease, disability, cognitive decline, future fracture risks, and mortality. [18]

LIMITATIONS OF STUDY

Data was collected from different restaurants and hotels in one city. The researcher did not measure weight or height with the help of a standardized method. The sample size of this study was small, and the researchers collected data from the males, so the results cannot be applied to another gender.

CONCLUSION

Handgrip strength of chefs and non-chefs was the same in the dominant and non-dominant hands. There was no significant statistical difference in the handgrip strength among chefs and non-chefs.

Conflict of Interest: None.

Authors' Contribution

FM: Drct Contribution, FA: Intellectual Contribution, AA: Study Design.

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