

## INTRODUCTION & PURPOSE

- The ability to grasp, hold, and apply force to objects is important in sports performance. This ability is demonstrated by the approximately 38 muscles of the forearm and hand.
- The purpose of this study was to determine the relationship between hand grip strength and various forearm and hand muscle strength tests.

## METHODS

This study was a correlational study examining the relationship between hand grip strength, pinch strength, and forearm strength in Division III college athletes. Subjects were recruited by word of mouth at Hardin Simmons University. Upon completion of the informed consent and demographic data collection, a 5-minute warm-up was conducted. Proceeding the warmup, individuals were tested on hand grip strength using a hand grip dynamometer on the left (HGD-L) and right side (HGD-R), pinch strength on the left (L) and right (R) side using a pinch gauge, and manual muscle strength on the left (MMT-L) and right (MMT-R) side using a dynamometer. The tip pinch (TP), key pinch (KP), and 3-jaw (3J) measures were taken for pinch strength. Wrist flexion (WF), wrist extension (WE), radial deviation (RD), ulnar deviation (UD), supination (S), and pronation (P) measures were taken for manual muscle testing.

## RESULTS

- There were 19 subjects (age = 22±5.8)
- A Pearson correlation was used to assess the data, significance was assessed at p=0.05 (Table 1.)

Table 1. Correlation between grip strength, pinch strength, and manual muscle testing.

Strength Variable	1	2
1. HGD, L		
2. HGD, R		
Tip Pinch, L	0.52*	0.55*
Tip Pinch, R	0.62**	0.7**
Key Pinch, L	0.84**	0.88**
Key Pinch, R	0.91**	0.9**
3-Jaw, L	0.76**	0.8**
3-Jaw, R	0.73**	0.77**
MMT WF, L	0.71**	0.7**
MMT WF, R	0.69**	0.68**
MMT WE, L	0.72**	0.66**
MMT WE, R	0.73**	0.68**
MMT RD, L	0.55*	0.48*
MMT RD, R	0.62**	0.58*
MMT UD, L	0.68**	0.66**
MMT UD, R	0.62**	0.59**
MMT S, L	0.84**	0.83**
MMT S, R	0.83**	0.83**
MMT P, L	0.9**	0.86**
MMT P, R	0.86**	0.79**

\*\*p < 0.01, \*p<0.05



Right Side Key Pinch Test



Left Side Hand Grip Dynamometer



Left Side Manual Muscle Test- Pronation

## CONCLUSIONS

The results indicate hand grip strength is directly related to pinch strength, and strength in actions of wrist flexion/extension, wrist radial deviation/ulnar deviation and supination/pronation.

## PRACTICAL APPLICATIONS

The results may suggest hand grip strength in college athletes is a good indicator of pinch, wrist, and forearm strength. Therefore, it seems plausible to implement exercises to develop hand grip strength for college athletes involved in sports requiring grip, pinch, and forearm strength.

## REFERENCES

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