

Tammany JE, Rogers JA, Latham SE, Sugar TS. THE EFFECT OF GRUNTING ON BASEBALL PITCHING VELOCITY. Hardin-Simmons University Department of Physical Therapy, Abilene, TX.

INTRODUCTION: Sports performance is a growing area in the realm of physical therapy. A physical therapist's in-depth understanding about biomechanics, kinesiology, therapeutic exercise and other topics provides a unique approach to improving performance in various athletes. Although not a direct mechanical adjustment, grunting has been shown to increase serve velocity in tennis players but has yet to be studied when administered during overhand pitching in baseball.^{1,2}

PURPOSE: This study investigated the relationship between grunting and throwing velocity in baseball pitchers. **SUBJECTS:** NCAA Division III collegiate baseball athletes from 2 universities in Abilene, TX. **METHODS:** Demographic data and consent were obtained before subjects completed an individualized 10-15-minute warmup of throws with and without grunting. Prior to warm-up, players were instructed on proper grunt technique and were coached throughout warmup on timing of grunt by researchers for optimal utilization. Participants performed randomized sets (3 grunting and 3 non-grunting trials) of 6 total overhand pitches. Pitches were thrown from a mound 60 feet and 6 inches from a catcher (standard home plate distance). A grunt trial was deemed appropriate if audible from 5 feet behind the catcher. Ball velocity was measured with a calibrated radar gun directly 5 feet behind the catcher (65 feet and 6 inches from the pitcher). Trials were omitted if the ball was not caught by the catcher, the player accidentally performed a grunt during a non-grunt trial, or a grunt was inaudible during a grunt trial. The scores of six successful trials were recorded with the mean score used for analysis. Descriptive statistics were used to determine the subject demographics. A Paired Samples t-Test (SPSS-25) was computed to determine the throwing velocity differences between grunt conditions and throwing velocity for each subject. **RESULTS:** The demographics of our sample consisted of: Average age = 20.33 years old (+/-1.63); Average height = 72.96 inches (+/- 2.65); Average weight = 197.38 lbs. (+/-28.78); Handedness = 4 Left/ 20 Right. None of our subjects reported having any previous grunting experience with pitching. A paired t-test, comparing ball velocities of grunting trials to non-grunting trials, found significant difference in the velocities between grunting and non-grunting ($M=79.51$, $SD=3.62$; $M=76.78$, $SD=3.91$; $(t(8.28)=23$, $p < 0.001)$ trials, respectively. **CONCLUSIONS:** Mean ball velocities with a maximal grunt averaged 2.73 mph faster than ball velocities without a grunt. Results were statistically significant showing an average increase of 3.4% in throwing velocities while grunting. **CLINICAL RELEVANCE:** Grunting increases throwing velocity which provides a competitive advantage in the sport of baseball. This study supports previous research which found similar increases in tennis serve and forehand velocities, along with increased force production and muscle activation. Additionally, other studies have found that forced expiration resulted in improvements in factors related to pitching success such as finger flexor force, trunk muscle activation and lumbopelvic control. Further research evaluating the biomechanical factors of grunting's effect on overhand pitching velocity is needed. Nevertheless, coaches and players should consider grunting as an easily implemented means of performance improvement in overhead throwing sports.