

Effects of Increasing Grip Diameter During Softball Warm-Up Swings on Subsequent Swing Performance

BEN M. KRINGS¹, ALISSA A. WIKA²

¹Department of Kinesiology, University of Wisconsin-Eau Claire, Eau Claire, WI

²Brain and Balance Center of Westchase, Tampa, FL

University of Wisconsin
Eau Claire



ABSTRACT

Optimizing swing performance through warm-up swings is an important component of a softball athlete's success. Utilizing post-activation potentiation may be a method to acutely enhance bat speed and power. **PURPOSE:** The purpose of this study was to compare the effects of warming up with a softball bat (SB) or utilizing a SB with the addition of fat grips (FG) on subsequent swing performance. **METHODS:** Division III female softball players ($n = 18$) participated in this investigation. Subjects came in for three sessions on nonconsecutive days. Session 1 consisted of gathering demographics and familiarized subjects with the protocol. During sessions 2 and 3, subjects performed five sets of five submaximal swings and two maximal swings at a softball-sized wiffle ball hung from a ceiling at a standardized height in a randomized and counterbalanced design. The sets were completed with an initial treatment set, FG or SB, a baseline measurement completed 30 s after the treatment set, and at three, six and nine minutes. During the first set of seven swings, subjects were instructed to complete maximal isometric contractions when using the FG and use normal grip pressure when using the SB while swinging at the ball. The remaining four sets were completed using no FG and normal grip pressure. Power (P), bat speed (BS), hand speed (HS), and time to contact (TC) were measured during each maximal swing in the last four sets by a commercially available swing analyzer. **RESULTS:** There were no significant main effects for treatment in regards to P (FG= 1.56 ± 0.30 , SB= 1.56 ± 0.40 kW), BS (FG= 51.50 ± 4.18 , SB= 51.54 ± 4.80 mph), HS (FG= 16.29 ± 1.58 , SB= 16.25 ± 1.80 mph), and TC (FG= 0.17 ± 0.02 , SB= 0.17 ± 0.02 s) ($p > 0.05$). There were also no main effects for timepoint or interaction effects for any variables. **CONCLUSIONS:** The use of FG to increase subsequent power production through post-activation potentiation was not found in this study. Although there were no differences between treatments, a commercially available swing analyzer can successfully provide important feedback immediately after swinging a bat.

BACKGROUND

Post-activation potentiation is a method used to increase power production after a short bout of high intensity exercise. (Kontou et al., 2018).

Softball players are constantly looking for ways to improve swing performance during warm-up swings prior to an at bat.

Previous research suggests a series of isometric contractions held in the early swing phase position increased subsequent softball bat velocity via post-activation potentiation (Gilmore et al., 2018).

PURPOSE

The purpose of this study was to compare the effects of warming up with a softball bat (SB) or utilizing a SB with the addition of fat grips (FG) on subsequent swing performance.

METHODS

Subjects

18 female National Collegiate Athletic Association (NCAA) Division III softball players (age: 19.2 ± 0.8 years, mass: 68.3 ± 10.6 kg, height: 166.2 ± 5.8 cm) participated in this study. All participants gave informed consent in accordance with the Institutional Review Board at the University of Wisconsin-Platteville.

Experimental Design

Subjects completed a total of 3 sessions. During session 1, subjects gave informed consent, height, weight, and grip strength were measured, and subjects were familiarized with the protocol. During sessions 2 and 3, subjects performed five sets of five submaximal swings and two maximal swings at a softball-sized wiffle ball hung from a ceiling at a standardized height in a randomized and counterbalanced design. The first set of swings was done by completing maximal isometric contractions with FG (2.25 cm model, Fat Gripz Enterprises, Toronto, ON, Canada) while swinging, or using normal grip pressure and no FG. 30 s after the initial set, the remaining four sets of swings were completed with no FG and normal grip pressure.

Power (P), bat speed (BS), hand speed (HS), and time to contact (TC) were measured during each maximal swing in the last four sets by a commercially available swing analyzer (Blast Softball, Blast Motion, Carlsbad, CA, USA) with live data synced to an iPad (Apple, Cupertino, USA).

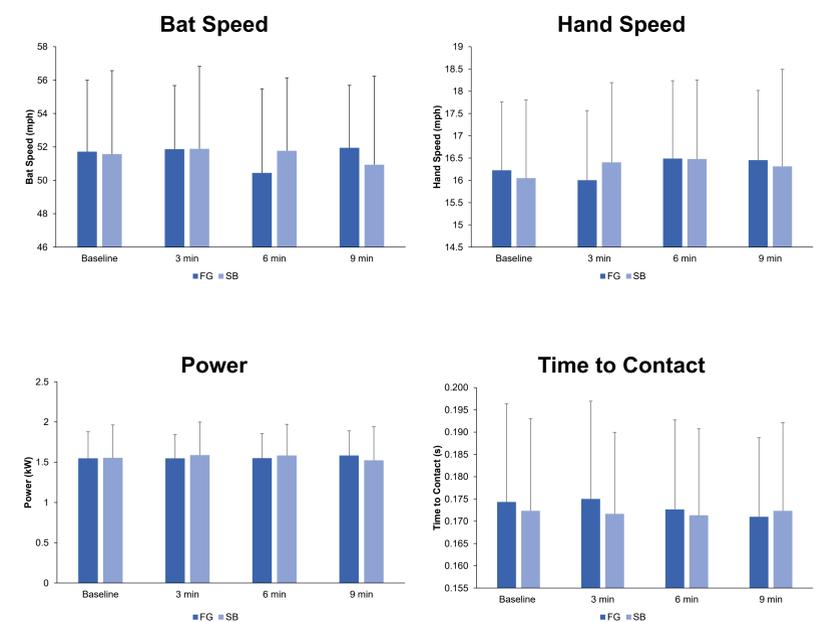
Statistical Analysis

Data are reported as mean \pm standard deviation (SD) with an alpha level of $p < 0.05$. To determine the effects of FG, both swings at the timepoints of 0, 3, 6, and 9 minutes were averaged. BS, HS, P, and TC were analyzed using a two-way (treatment (FG vs. SB) \times time (0, 3, 6, 9 min) repeated measures analysis of variance. If significant interaction or main effects were observed, pairwise comparisons with Bonferroni's correction were applied. All statistical analyses were carried out using SPSS (v24, IBM Corporation, Armonk, NY, USA)



RESULTS

There were no significant main effects for treatment in regards to P (FG= 1.56 ± 0.30 , SB= 1.56 ± 0.40 kW), BS (FG= 51.50 ± 4.18 , SB= 51.54 ± 4.80 mph), HS (FG= 16.29 ± 1.58 , SB= 16.25 ± 1.80 mph), and TC (FG= 0.17 ± 0.02 , SB= 0.17 ± 0.02 s) ($p > 0.05$). There were also no main effects for timepoint or interaction effects for any variables. BS, HS, TC, and P values between treatments and timepoints are shown in the figures below.



CONCLUSION

Utilizing FG during softball warm-up swings led to no enhancements in subsequent swing performance.

Commercially available swings analyzers provide real time data that may be beneficial for softball coaches.

Softball swing performance has been shown to be enhanced when using larger musculature to optimize post-activation potentiation (Gilmore et al. 2018). Future studies should manipulate the isometric contraction time while using FG to fully elucidate any potential benefits.

REFERENCES

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