

EFFECTS OF A SIMULATED GAME ON PITCHING KINEMATICS IN YOUTH FEMALE SOFTBALL PITCHERS

Oliver, Gretchen D ¹ ; Downs, Jessica L ¹ ; Friesen, Kenzie B ¹ ; Anz, Adam W ² ; Dugas, Jeff R ³ ; Andrews, James R ² ¹ Auburn University, AL, USA ² Andrews Institute ³ Andrews Sports Medicine & Orthopaedic Center . Orthopaedic Journal of Sports Medicine ; Thousand Oaks Vol. 8, Iss. 4_suppl3, (Apr 2020).

[ProQuest document link](#)

ABSTRACT (ENGLISH)

Background:

Despite evidence that overuse is the most common mechanism of injury, softball pitchers currently have no pitch count regulations. Pain has been associated with certain pitching pathomechanics, and some reports indicate increased pain following a single pitching bout.

Hypothesis/Purpose:

The purpose of this study was to analyze kinematic variables such as center of mass (COM), trunk, and stride length during the first and last inning of a simulated game in youth softball pitchers. We hypothesized COM to be shifted back toward the drive leg, stride length would be increased, and trunk kinematics would be altered during the last inning of a simulated game as compared to the first inning.

Methods:

Participants included thirty-two softball pitchers (12.4±1.6yrs., 159.4±8.9cm, 62.0±13.6kg). Participants were deemed injury and surgery free for the past six months and were currently active as a pitcher on their teams' roster. Kinematic data were collected at 100Hz using an electromagnetic system. After warm-up, participants were instructed to throw random game situations, provided by the investigator, with the catcher located at regulation distance (43ft). Participants were required to produce three outs an inning as per a regulation softball game. Three fastballs from the first and last inning were recorded and used for analysis. Kinematics were analyzed at five different pitch events including: start of pitch, top of pitch, foot contact, ball release, and follow through.

Results:

A paired samples t-test revealed a statistically significant difference in trunk rotation during the first three pitching events from the first and last inning. Specifically, pitchers exhibited less trunk rotation towards the pitching arm side. A bivariate Pearson's correlation showed volume of pitches was correlated with stride length ($r=.367, p=.039$) and COM ($r=.364, p=.041$) at the start of the pitch, and trunk flexion at top of pitch ($r=-.392, p=.026$), foot contact ($r=-.413, p=.019$), and follow-through ($r=-.436, p=.013$).

Conclusion/Significance:

Trunk kinematics, stride length, and COM were altered as pitch volume increased. These results provide clinical importance as the trunk pathomechanics seen may be indicative of poor trunk control and fatigue. Although it is out of the realm of this study to state whether the kinematic changes seen are associated with injury, we do know that deficits in the kinetic chain are associated with injury and that trunk pathomechanics are associated with pain in collegiate softball pitchers. Research should continue to investigate the effects of pitch count, pitch mechanics, and injury in youth softball pitchers.

DETAILS

Subject:	Kinematics; Pain; Regulation; Softball
URL:	https://journals.sagepub.com/doi/10.1177/2325967120S00135
Publication title:	Orthopaedic Journal of Sports Medicine; Thousand Oaks
Volume:	8
Issue:	4_suppl3
Publication year:	2020
Publication date:	Apr 2020
Publisher:	Sage Publications Ltd.
Place of publication:	Thousand Oaks
Country of publication:	United Kingdom, Thousand Oaks
Publication subject:	Medical Sciences--Orthopedics And Traumatology
e-ISSN:	23259671
Source type:	Scholarly Journal
Language of publication:	English
Document type:	Journal Article
DOI:	http://dx.doi.org/10.1177/2325967120S00135
ProQuest document ID:	2484696276
Document URL:	https://login.ezproxy.lib.uwf.edu/login?url=https://www.proquest.com/scholarly-journals/effects-simulated-game-on-pitching-kinematics/docview/2484696276/se-2
Copyright:	© The Author(s) 2020. This work is licensed under the Creative Commons Attribution – Non-Commercial – No Derivatives License https://creativecommons.org/licenses/by-nc-nd/4.0/ (the "License"). Notwithstanding the ProQuest Terms and Conditions, you may use this content in accordance with the terms of the License.
Last updated:	2021-02-02
Database:	Nursing & Allied Health Premium, Health & Medical Collection, ProQuest Central

LINKS

[Find It](#), [Check Full Text Finder for Full Text](#)

Database copyright © 2021 ProQuest LLC. All rights reserved.

[Terms and Conditions](#) [Contact ProQuest](#)