

## ABSTRACT

**Purpose:** Exercise is a necessity to adults that strive to live healthy lives. Many find it difficult to find time in their busy schedules, especially in families with children. Some adults with young children use stroller running (SR) as a form of exercise. However, little is known about how SR alters lower extremity joint moments during running. The purpose of this study was to compare sagittal plane moments of the lower extremity during SR with traditional running.

**Methods:** 13 recreational runners were asked to run behind a Thule Urban Glide 2 jogging stroller suspended over an instrumented treadmill (Bertec, Inc, Columbus, OH). The study measured running in four different conditions: one with the participants right hand on the handlebar, another with left hand on the handlebar, one with both hands on handlebar, and running without the stroller. The first three conditions were randomized between participants, but the final condition was always performed without the stroller. Biomechanical data was collected with Vicon Nexus 2.3 (Vicon, Inc., Oxford, UK) and processed through Visual 3D (5.0, C-Motion, Inc., Germantown, MD, USA)

**Results:** There were no differences observed between conditions for any of the variables under consideration. The peak plantar flexion moment at push off, peak knee extension moment at weight acceptance, and both the peak hip flexion and extension moments were similar between all conditions. It is worth noting that the standard deviations in the conditions between subjects were always reduced by half in the traditional running condition compared to all SR conditions.

**Discussion:** The data collected showed no difference between moments of the lower extremities joints in all conditions. These result show similar demands to the lower extremity musculoskeletal system for stroller running. This research provides insight to some of the differences during SR, but does not include the propulsion of the stroller. This propulsion forward of the stroller, could provide more insight on alterations of moments of the lower extremities during SR.

## METHODS



Subject Characteristics (Mean ± SD)	
N	13
Height (m)	1.81 ± 0.08
Mass (kg)	82.6 ± 11.10
Treadmill Speed (m/s)	2.59 ± 0.30

- Recreational runners were asked to run behind a Thule Urban Glide 2 jogging stroller suspended over an instrumented treadmill.

- Subjects ran for 4 minutes during the following conditions: no stroller, right hand on stroller, left hand on stroller, and both hands on stroller.
- Biomechanical data was collected with Vicon Nexus 2.3 (Vicon, Inc., Oxford, UK) and processed through Visual 3D (5.0, C-Motion, Inc., Germantown, MD, USA).

## DISCUSSION

- Our results suggest that running with and without a stroller does not change the peak moments of the lower extremity. Regardless of the method of pushing the stroller.
- Data suggests that the demands on the lower extremity are not altered when running at the same velocity with hands connected to a jogging stroller.
- This study was limited by not having the runners propel the stroller forward. Instead only comparing conditions when the hands are connected to the stroller and feet are behind a stationary stroller.
- Future direction of studies should see if the propulsion of the stroller would alter these same variables, thus changing the demands on the lower extremity.

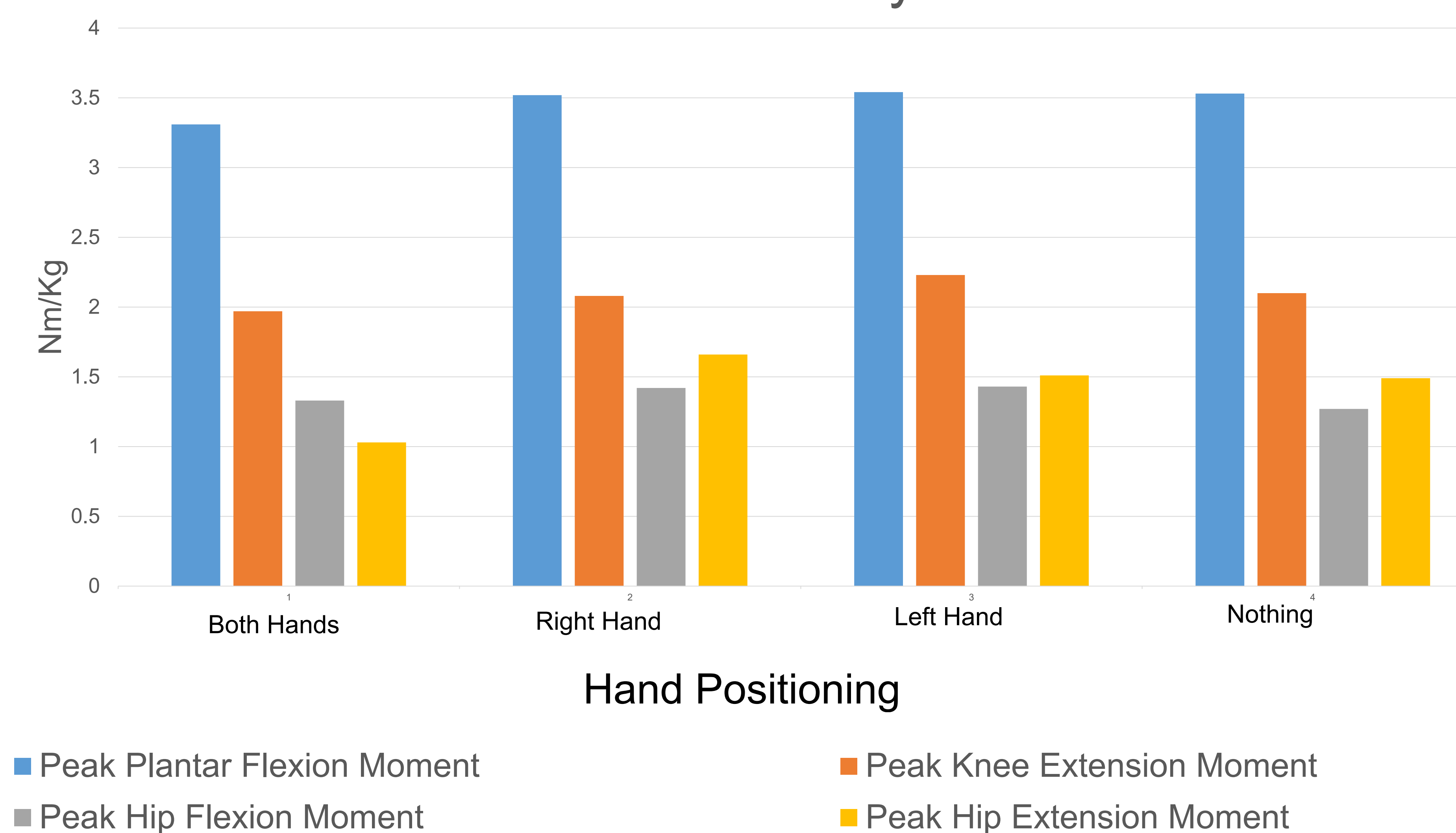
## INTRODUCTION



- Finding time to exercise can be difficult with young children. Many parents use stroller jogging to exercise.
- Research Objective:** This experiment researched how the weight of a stroller would affect lower extremity moments while running.

## RESULTS

Peak Mean Lower Extremity Moments



- The data showed no differences of lower extremity moments of hip, knee and ankle joints while jogging with a stroller and without a stroller.

