Professional baseball pitchers' patterns of use and results of weighted ball training: a pilot study

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Background: Over the past two decades, weighted-ball programs have gained popularity in baseball. The training has varied including use of light or heavy weight balls for specific training progressions, warm up or cool down or as an adjunct to training programs. Little is known about the injury risk associated with weighted ball use in the youth through collegiate pitchers, less is known about the injury risk to professional baseball pitchers when using weighted ball as an adjunct to their regular training program.
Methods: A prospective cohort study was conducted and started during 2023 season on Minor League Baseball (MiLB) pitchers in one Major League Baseball (MLB) organization. This is an interim safety analysis of a multiple year study, after one year of follow up. Pitchers were surveyed in spring training on their use of weighted ball and their associated training habits. Pitchers were questioned if they used weighted ball training (yes/no). If answered yes, pitchers were furthered questioned on their specific training habits including use as a warmup strategy, performance training (i.e., increase velocity), and/or as a recovery strategy (i.e., post throw). All epidemiological calculations were completed for the entire cohort (i.e., all pitchers) and stratified by weighted ball training. Overall injury rates were calculated for per 1000 exposures. Overall injury prevalence was also calculated.
Results: A total of 88 pitchers (Fastball Velocity: Weighted Ball: 92.5 (21.7); No Weighted Ball: 92.9 (1.9)) were included with 52% reported using weighted ball training and 48% did not use weighted ball training. Pitchers that used weighted ball training, 21% reported using weighted balls for warm up, 2% for recovery, and 77% for performance. A total of 28 injuries (upper extremity: 20; Trunk 8) were suffered by pitchers during the MiLB season. Pitchers that used weighted ball training suffered 8 more injuries at a 1.1 greater injury rate per 1,000 athlete exposure days compared to pitchers that did not use weighted ball training. Pitchers that used weighted ball training demonstrated an arm injury rate of 11.8 arm injuries per 1000 pitching game exposures, pitchers who did not use weighted ball training demonstrated an arm injury rate of 7.5 arm injuries per 1000 pitching game exposures. Pitchers that used weighted ball training demonstrated a trunk injury rate of 5.9 trunk injuries per 1000 pitching game exposures, pitchers who did not use weighted ball training demonstrated a trunk injury rate of 2.1 trunk injuries per 1000 pitching game exposures.
Conclusions: The percentage of pitchers participating in the weighted ball training was similar to those who did not use weighted ball training. Average fastball pitch velocity was similar between pitchers was similar to those who did not use weighted ball training. Arm injuries and trunk injuries were descriptively greater in pitchers that performed weighted ball training. Caution may be advised when using weighted ball training in professional pitchers. Further investigations are needed to understand the mechanisms underlying weighted ball training concerning pitch velocity training.