Influence of Pre-Performance Routines on Perpetual Preparedness in Collegiate Baseball Players

Exercise Science

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Introduction

When discussing pre-performance routines, generally the term can be defined as a singular or set of particular actions, either mental or physical, that prepare an athlete for competition. These behaviors can be completely individualized or transferable, simple/ complex, or impersonal/ personal as the athlete desires. A routine can range from anything such as: listening to a certain song before play to positive self- talk or imagery, performing a particular physical warm-up exercise, or having a set way of putting on your uniform. The purpose of these routines is to maximize the athlete's self-confidence in order to eliminate distractions, nervous tension, or stress in hopes of getting the athlete to perform at their highest level. The common factor among these said actions, illustrated in past research, is that they help athletes achieve a sense of relaxation in hopes of bettering performance (Gröpel & Beckmann, 2017).

Past research has examined the relationship between self-confidence and athlete's performance and how this is influenced by their ability to manage the many intrinsic and extrinsic variables of sport through coping (Levy, Nicholls, & Polman, 2011). Other studies have dug into different facets of a pre-performance routine such as: motivation, satisfaction, and self- talk to determine how much of a role positive and negative self-talk plays during competition (Karamitrou, Comoutos, Hatzigeorgiadis, & Theodorakis, 2017). Other research has found that factors such as stress have harmful effects on performance and that an athlete's ability to control their emotions is essential to performing well in highly important situations in competition (Walsh, 2011). In other cases, research has been conducted in order to see if a pre-performance routine could be a prescribed as a possible treatment to athlete's who have a tendency toward not performing well in high pressure situations or better referred to as "choking" (Mesagno, Marchant, & Morris, 2008). Some research has even indicated that there is indeed a positive relationship between pre- performance routines and improved performance (Otto, Gentner, Czech, Burdette, & Biber, 2014). Despite all of this information regarding PPR, there has been no research regarding the removal or alteration of these routines.

There has been a fair share of both qualitative and quantitative studies focused towards pre-performance routines, but few have featured both components. The purpose of this study is to examine Division III baseball players' perceptions of the different aspects of a pre-performance routine, the importance of such routines, and the impact on performance if a particular routine is interrupted or cannot be performed. I hypothesize that once the player's routine is altered or removed this will lead to the player immediately becoming stressed from not being able to perform their routine. Furthermore, I see this not allowing them to fully relax and reach their zone of optimal readiness to perform.

Methods

All data were collected on DIII baseball players (age = 18-22 yrs). The design of this study combines both a qualitative and quantitative facet. This study consisted of a questionnaire to assess aspects of pre-performance routine (n = 49) and a hitting simulation evaluating the impact of removing pre-performance routines (n = 13). This study was approved by the college Institutional Review Board.

The hitting simulation consisted of each subject hitting twenty baseballs off of a set tee at game intensity. The first ten swings the subject will utilize their normal pre-swing routine they would perform before stepping into the batter's box in a game. The last ten swings the subject was required to refrain from performing their routine and take a generic approach to the plate. For the purpose of this study, the term "generic approach" was defined as stepping into the batter's box one foot at a time and getting into their set batting stance. Each player stepped out of the batter's box after each swing, performed their routine, and re-entered the box for the next swing. This was done to simulate the feel of a real game from pitch to pitch.

After every fifth rep of the hitting simulation the subject was asked to provide a rate of comfortability using a 1-10 scale and a visual scale (100mm line) to interpret how they felt about that set of reps. The outcome of the task itself (how well the ball is hit) is not as important and not directly measured. The feeling of readiness to perform is the main attribute being measured with the outcome of the task being taken into account. Each player was allowed to warmup with ten reps off the tee before the start of the initial 10 swings to ensure both mental and physical readiness. Questionnaires were administered to the entire team to assess their prior knowledge of and opinions regarding these routines. A batting practice simulation was conducted with thirteen pre-selected position players in order to assess the impact of disrupting a player's routine, how this affects their performance, and the athlete's perception on this change to their routine.

This study utilized a repeated measures ANOVA to analyze the data from the two conditions of the player's normal routine versus when these routines are disrupted. SPSS version 17.0 was used to analyze the hitting simulation data. Cohen's d effect size was calculated.

Results

The first portion of the data was gathered from the questionnaire. After evaluating, I was able to see certain trends on each question. Of the 49 participants, approximately 93% have been playing baseball for more than 10 years which allows me to gauge their skill level. All 49 subjects had been experienced the weight of high pressure situations, and that a mental approach to baseball is essential to being successful. Around 78% of the players indicated that they have/ had a pre-performance routine and approximately 92% believe these routines play a role in their overall performance. Majority of players (89%) find themselves able to remain in their comfort zone throughout the course of a game, however 85% of players believe their performance is affected when they do venture outside of their comfort zone. Finally, 95% of players believe that a specific pre-performance routine would be helpful in returning their comfort levels to baseline in a game. The second portion of this study is from the batting simulation where subjects were asked to rate their perceived level of comfortability after each batting round.

Table 1. Perceptual level of comfortability of participants per round (n = 13).

Round	Mean	Std. Deviation
Round 1	80.2	12.9
Round 2	83.5	12.8
Round 3	55.9	19.3
Round 4	58.7	23.6

The results from the table indicated that round 1 had a statically higher mean than rounds 3 ($p = 0.001$, Cohen's $d = 1.5$) and 4 ($p = 0.011$, Cohen's $d = 1.17$). Round 2 was statistically higher than round 3 ($p < 0.001$, Cohen's $d = 1.72$) and 4 ($p = 0.004$, Cohen's $d = 1.36$). These differences are further supported by large effect sizes.

Discussion

Overall, almost 97% of the participants in the questionnaire believed that PPRs can assist a baseball player in getting them into a comfort zone in order optimally perform. As demonstrated in Table 1, it was shown that standardizing a hitter's PPR drastically reduced their perceived level of comfortability prior to hitting and likely impaired their readiness to perform. Additionally, we believe that individuals with a more extravagant PPR may be impacted to a greater extent as 2 subjects in the simulation had a very simple routine and when standardized did not report as large of a perceptual change as most subjects. Future research should focus on practical simulations for pitchers and how the standardization of their routines affects their readiness to perform. Also, research evaluating PPR removal on performance metrics in addition to perceptual responses would be of value.

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