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Published: 01/10/2018

Document Version:
Peer reviewed version

[Link to publication in Bond University research repository.](#)

Recommended citation(APA):

Cesario , K. A., Bloodgood, A. M., Hernandez, J., Orr, R. M., Dawes, J. J., Dulla, J., Moreno, M. R., & Lockie, R. G. (2018). *Don't Go Breaking My Heart: The Effects of Ability-Based Training on the Health and Fitness Characteristics of Custody Assistant Recruits*. Poster session presented at The 38th Annual Meeting of the Southwest Regional Chapter of the American College of Sports Medicine, Costa Mesa, United States.

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Don't Go Breaking My Heart: The Effects of Ability-Based Training on the Health and Fitness Characteristics of Custody Assistant Recruits

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ABSTRACT

Custody Assistants (CAs) are responsible for security in detention facilities, where they may be required to complete high-intensity physical actions to ensure the personal safety of themselves, personnel, and inmates. Due to these job demands, and need for overall fitness, physical training (PT) programs are commonly implemented during academy. A paramilitary one-size-fits-all model, via modalities such as formation runs and bodyweight calisthenics, are a common form of PT. However, this type of training may not be optimal for each individual CA recruit to make positive adaptations. The purpose of this study was to analyze an ability-based approach to PT in a CA academy compared to the traditional approach. Retrospective analysis was performed on data from two CA classes consisting of 39 (23 men, 16 women) and 36 (22 men, 13 women) recruits. Recruits in the first class received 15 PT sessions in the traditional training (TT) model, where recruits were expected to all complete the same exercises and distance runs. Recruits in the ability-based training (ABT) group were subject to 15 PT sessions comprising of an ABT circuit and interval running workouts. Pre- and post-academy training, health and fitness assessments were performed, which included: resting heart rate (RHR); systolic and diastolic blood pressure (BP); push-ups and sit-ups in 60 s; and recovery heart rate from the YMCA step test. Changes in these assessments were compared using 2x2 factorial ANOVA for each measure, and a repeated measures ANOVA for each class ($p < 0.05$). Results revealed significant differences in performance in both classes for both the recovery heart rate for the YMCA (reduced) and push-ups (increased), with no difference between the groups. The ABT group significantly lowered their RHR post academy (6.5 mean reduction in bpm). Systolic BP did not significantly change post-academy for either group, while diastolic BP increased in the TT group (5.8 mmHg mean increase) but not the ABT group. Although TT and ABT achieved similar changes in fitness as measured in this study, the ABT group was able to achieve these while also reducing RHR and maintaining diastolic BP. RHR can be a predictor of cardiovascular and all-cause mortality. Any increases in diastolic BP for the TT group could be a maladaptation to the rigors of academy, including chronic stress and the physical training load. BP is also a factor in predicting the development of coronary heart disease. Given these positive adaptations in heart rate and BP for CAs, further research should be done to confirm these results and investigate the wider and systemic implementation of ABT in CA.

INTRODUCTION

- Custody Assistants (CAs) are responsible for security in detention facilities, where they may be required to complete high-intensity physical actions to ensure the personal safety of themselves, personnel, and inmates (3).
- Due to these job demands, and need for overall fitness, physical training (PT) programs are commonly implemented during academy (2). A paramilitary one-size-fits-all model, via modalities such as formation runs and bodyweight calisthenics, are a common form of PT. However, this type of training may not be optimal for each individual CA recruit to make positive adaptations.
- Due to the large variance in training age, some recruits may not have the ability to complete all of the TT and so would not gain any positive adaptations. Others with a higher training age may not be challenged enough to elicit a training adaptation, and some may even decondition.
- The purpose of this study was to analyze an ability-based approach to PT in a CA academy compared to the traditional approach.

METHODS

- Retrospective analysis was performed on data from two CA classes consisting of 39 (23 men, 16 women) and 36 (22 men, 13 women) recruits (age range = 18-52 years).
- The control class received a traditional training program (TT) which was designed and implemented by the training staff of the agency and consisted of a large volume of steady-state running and body weight strength endurance exercise and calisthenics (e.g. push-ups and sit-ups completed for repetitions).
- Recruits in the ability-based training (ABT) group were given a specially designed program consisting of 15 sessions designed by the experimenters.
- The ability-based program scaled the exercise activity to the ability level of each recruit. For example, in the case of running this meant altering the sprint distance so that each recruit's distance more closely matched the desired training effort, based off their 1.5 mile run time. As shown in Figure 1, this meant fitter recruits completed a greater distance for a run than less fit recruits over an equivalent interval time.
- Pre- and post-academy training, health and fitness assessments were performed, which included: resting heart rate (RHR); systolic and diastolic blood pressure (BP); push-ups and sit-ups in 60 s; and recovery heart rate (HR) from the YMCA step test.

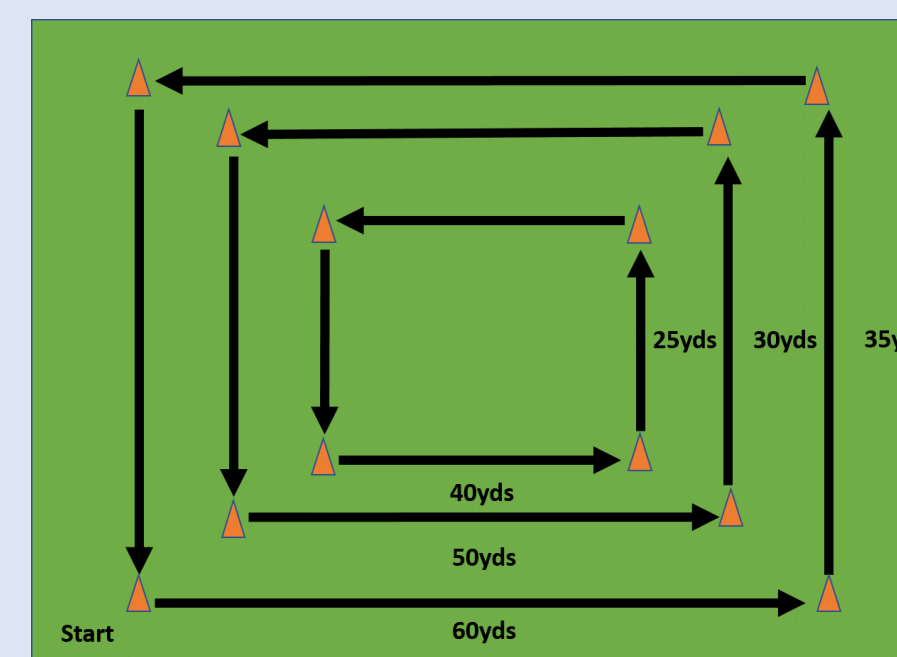
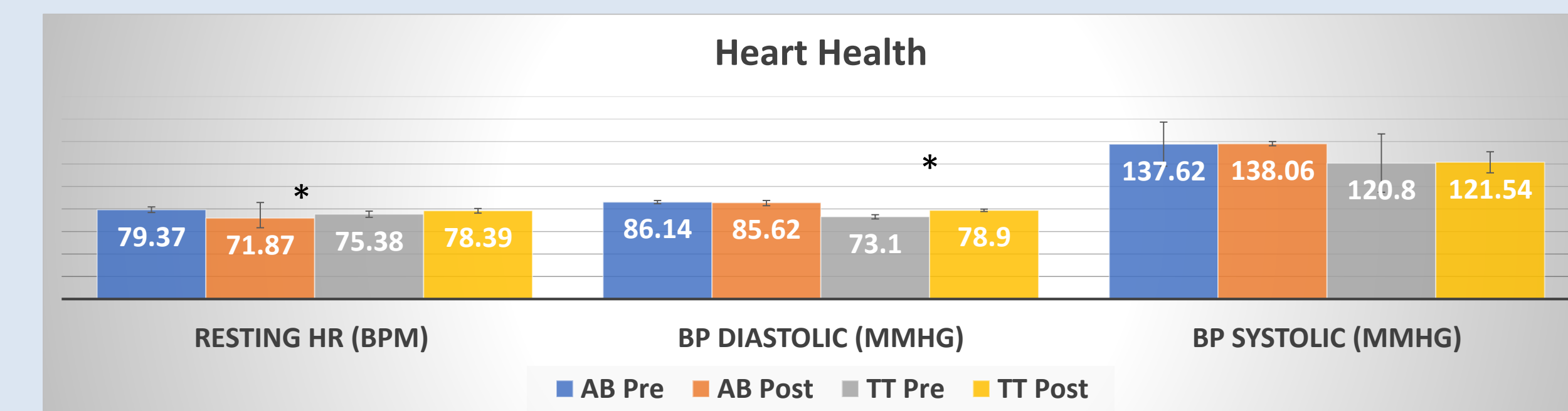


Figure 1. Ability based run set up.

- Pre academy assessment was done on day 1 of the academy and post assessment was done within the week of graduation.
- Changes in these assessments were compared using 2x2 factorial ANOVA for each measure, and a repeated measures ANOVA for each class ($p < 0.05$).

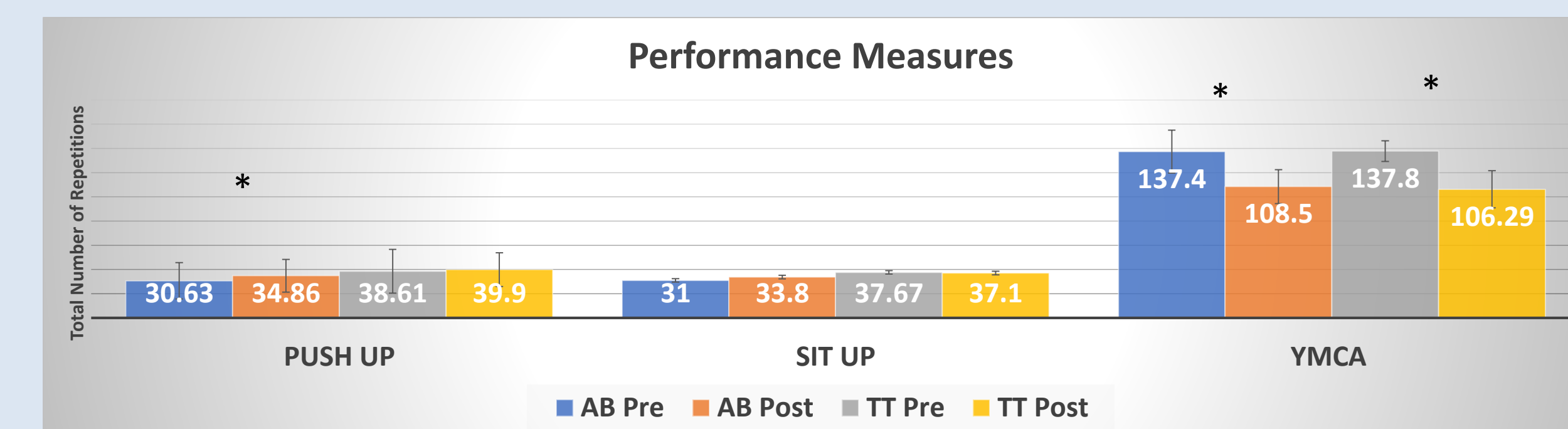
RESULTS

- Figure 2 displays the heart health related data. The ABT group significantly lowered their RHR post academy (6.5 mean reduction in bpm).
- Systolic BP did not significantly change post-academy for either group, while diastolic BP increased in the TT group (5.8 mmHg mean increase) but not the ABT group.
- The results also revealed significant differences in performance in both classes for both the recovery HR for the YMCA (reduced) and push-ups (increased), with no difference between the groups (Figure 3).



* Significant ($p < 0.05$) change pre to post.

Figure 2. Data (mean ± SD) for the health measures of resting heart rate and blood pressure for the TT and ABT groups.



* Significant ($p < 0.05$) change pre to post.

Figure 3. Data (mean ± SD) for the performance measures of push-ups, sit-ups, and YMCA recovery HR for the TT and ABT groups.

CONCLUSIONS

- Although TT and ABT achieved similar changes in fitness as measured in this study, the ABT group was able to achieve these while also reducing RHR and maintaining diastolic BP.
- RHR can be a predictor of cardiovascular and all-cause mortality and BP is also a factor in predicting the development of coronary heart disease.
- The increases in diastolic BP for the TT group could be a maladaptation to the rigors of academy, including chronic stress and the physical training load (1,4).
- A possible explanation for the increase in BP is total stress of the academy; although mental stress was probably similar for both groups, the physical stress seemed to be more appropriate for the ABT group.
- Given these positive adaptations in heart rate and BP for CAs, further research should be done to confirm these results and investigate the wider and systemic implementation of ABT in CA.

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