The Effect of Aerobic Fitness on Psychological Stress as Measured by Heart Rate Response During Academy Training in a Custody Assistant Recruit Population

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The Effect of Aerobic Fitness on Psychological Stress During Academy Training in a Custody Assistant Recruit Population

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ABSTRACT

Custody Assistants (CA) have a job that will often subject them to high levels of psychological stress. During performance of daily job tasks, CAs need to be prepared to attend to situations that require immediate decision making and control of stress in the moment. The purpose of this study was to determine the effect of aerobic fitness on the physiological response of CAs to a high stress situation on the first day of academy using heart rate (HR) data.

METHODS

• Retrospective analysis was performed on data from one CA class of 26 recruits composed of 15 males (age = 23.0 ± 3.3 years, body mass = 81.55 ± 11.68 kg, height = 1.75 ± 0.56 m) and 11 females (age = 28.90 ± 6.99, body mass = 66.45 ± 8.84 kg, height = 1.70 ± 0.50 m).

• The session was not designed as a physical training session; nevertheless, commands from the staff, combined with limited physical activity, were used to elicit a stress response.

• The session was organized so that the recruits were split up into 3 platoons. Due to the platoon structure of the session, training staff would punish an entire platoon with relatively light physical activity such as holding a squat position or doing push-ups.

• HR data were gathered using HR monitors, and categorized (relative to age-predicted maximum HR, HRmax) according to American College of Sports Medicine (ACSM) guidelines (very light: ≤75% HRmax, light: 76-83% HRmax, moderate: 84-90% HRmax, vigorous: ≥90% HRmax).

RESULTS

• There were no significant differences in time spent in the different HR zones between the three fitness groups. The only significant finding was that recruits in the Low fit group were only categorized as vigorous (95%) for this 10-minute task. (3%) were classified as having poor or very poor aerobic fitness. Individual recruits are seldom the sole reason of consequences due to any problem related within the group. This may have meant that poorer fit recruits made worse that impacted the response of the group.

PRACTICAL APPLICATIONS

• Psychological stress training sessions can elicit physiological responses equivalent to vigorous exercise sessions as defined by ACSM guidelines.

• Law enforcement agencies should be aware of the aerobic fitness levels of their CA recruits, which was considered relatively poor in this class. The homogeneity of fitness levels may have not allowed for adequate statistical power to have been realized due to the fewer members of the high fit group.

• Future research should attempt to use a larger maximal aerobic test such as a YOCT test as a measure of aerobic fitness as aerobic fitness measured by the submaximal 2.4-km run did not appear to attenuate physiological response to stress.

CONCLUSION

• These data suggest that a psychological stress focused session training with limited physical activity can elicit a heart rate response similar to a vigorous aerobic training session as defined by the ACSM.

• Aerobic fitness as measured by the 2.4-km run was not found to have an attenuating effect on the physiological response to stress contrary to previous research.15 One study used a graded maximal aerobic cycling test to determine aerobic fitness and not overall submaximal test.1 A graded test incorporates an externally-paced maximal effort may be required to provide a more appropriate measure of aerobic fitness.

• Nonetheless, the class was homogenous in its physical fitness abilities with over half the class (54/26 recruits) scoring either poor or very poor aerobic fitness. The structure of the session was such that a single recruit could be responsible for making a decision that caused the group they were in to receive more psychological stress, therefore, it is possible that the poorer fit recruits made errors that impacted the HR responses of the MF and HG groups.

Figure 1. Number of recruits categorized by fitness levels.

Figure 2. Total time spent (minutes) in each of the ACSM defined Heart Rate Zones for the High Fit, Moderate Fit and Low Fit groups of CA recruits.