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Competitive Aging Cyclists: Variables Associated with Successful Performance

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Background

Competitive aging cyclists are a growing population. The National Senior Games provides the largest platform in the world for these athletes to go up against other aged-matched cyclists. Current literature has investigated variables related to performance, such as joint mobility, strength training, and endurance training, in young cycling populations. Physical capacity measures known to associate with success in cycling competitions have yet to be investigated for the competitive aging cyclists..

Purpose

The purpose of this study is to determine modifiable variables from the Senior Athlete Fitness Exam (SAFE) that relate to superior performance for competitive aging cyclists.

Methods

Aging athletes who competed in cycling events of the National Senior Games from 2013- 2019 and participated in the SAFE, were included in this study. Race times for senior athletes included the 5K, 10K, 20K and 40K cycling races. SAFE results were collected as part of a larger study. The SAFE is a health screen designed for aging athletes that measures cardiovascular risk factors, flexibility, strength, and balance as well as exercise behaviors. Time trial events (5K, 10K) occur when cyclists start the race one at at time with 30 seconds to 1 minute intervals between riders. Road race events (20K, 40K) occur when there is a mass start of cyclists according to gender and age-matched categories.

SAFE MEASURES:

Cardiovascular Health
- BMI
- Waist to hip ratio

Flexibility
- Shoulder flexion
- Thomas test
- Calf flexibility (knee straight)

Mobility
- Usual gait speed
- Fast gait speed
- Gait reserve

Strength
- Hand grip strength
- Five Times Sit To Stand

Balance
- Single leg stance eyes open
- Single leg stance eyes closed
- Single leg stance eyes open, foam

Data Analysis

Data was analyzed using SPSS 25. Pearson correlations were utilized to find relationships between race times and SAFE measures. Significant Pearson correlations of r >0.25 were classified as meaningful and were analyzed via stepwise regression to determine ideal models to predict success. Age was controlled for within the stepwise regression. Alpha was set at $p<0.05$.

Results

Subjects included 63 males and 69 females ages 50-88 (mean age=67, SD=9.10).
All SAFE variables demonstrated statistical significance and meaningful correlations to race times with the exception of the following:
- Exercise frequency
- Thomas test results
- Strength training volume
- Gait speed reserve

SAFE
SENIOR ATHLETE FITNESS EXAM

Figure 1. Male Pearson Correlation Results

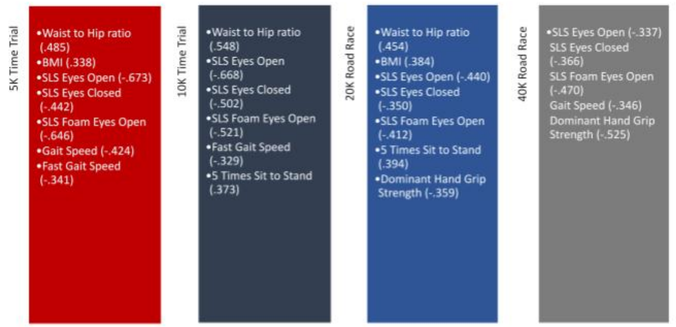


Figure 2. Female Pearson Correlation Results

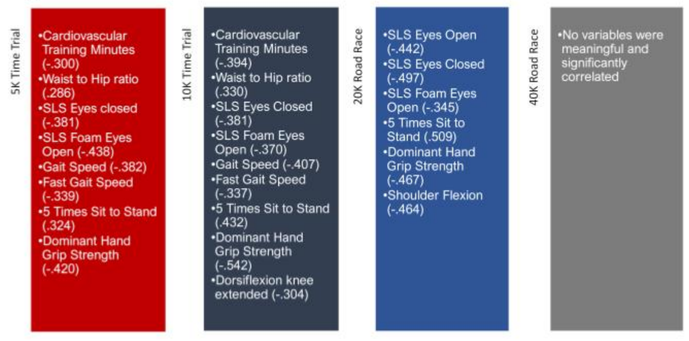


Figure 3. Stepwise Regression Male Cyclist Performance

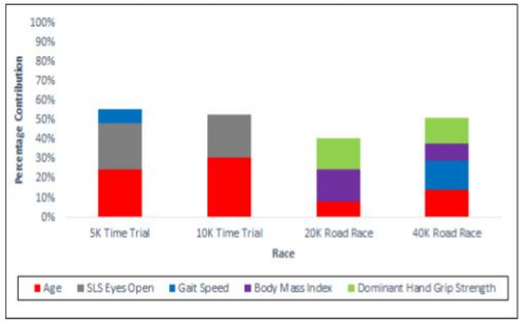
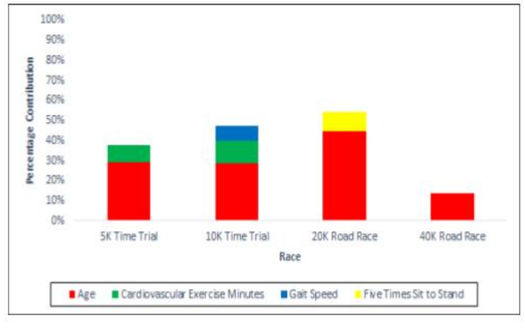


Figure 4. Stepwise Regression Female Cyclist Performance



All SAFE variables listed were found to be statistically significant with a p-value <.05 and low to moderately correlated with a r-value >.25
Abbreviations: Days per week, Days per week spent exercising; Cardiovascular Training Minutes, minutes of cardiovascular training in one week; Strength training Minutes, minutes spent strength training in one week; SLS, single leg stance

Discussion

Factors associated with improved performance vary both by gender and event
- All cyclists demonstrate a need for increased balance, as this was correlated to every race for both male and female cyclists.
- Increased gait speed was correlated with the sprint-styled races in male cyclists indicating improvements in physical fitness, decreased functional impairments and higher quality of life may increase their overall cycling performance.
- Male cyclists participating in the 20k and 40k road races may choose to focus on generalized strength training as grip strength has been associated with upper and lower limb strength.
- For the female cyclists in the 5k and 10k races, dedicating time to cardiovascular fitness may be more important as this was a strong predictor for performance outcomes.
- Although there were fewer correlations for the female's long distance road races, shoulder range of motion was deemed important. Implementing a stretching program may therefore provide benefits to improving performance time.
- For nearly all women's cycling events, overall power and strength appear to be vital since both grip strength and five times sit to stand were highly correlated.

Conclusion

Within the SAFE, multiple physical performance measures are significantly predictive of success in competitive aging cyclists. For male cyclists measures of balance and strength appeared most predictive of success while female athletes with higher volumes of cardiovascular exercise appeared most successful. Measures of flexibility were notably absent from any predictive models.

Clinical Relevance

Aging cyclists may benefit from attending to training that would enhance these measures in order to find more success in competitive cycling events.