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Introduction

With the increasing incidence of obesity and type II diabetes amongst youth in the past three decades¹, it is unclear how physical fitness and endurance has correlated with these trends². Our goal was to understand how mean endurance time on a standardized endurance test, a proxy for physical fitness, has changed in healthy individuals in the past 3 decades and whether these trends can be identified independently of trends in BMI.

Materials & Methods

We conducted a retrospective cross sectional study reviewing the health records of consecutive apparently healthy Chicago inner city children who underwent an exercise Bruce Protocol treadmill test from 1983 – 2010. Patients with known cardiovascular conditions were excluded. 436 children (mean age 12.6 ± 3.2 yrs, 57% male) were identified to include in the data analysis. Patients were divided in 5 groups in 5 year intervals based on the date of testing. Endurance time, gender, race, age, and body mass index (BMI) data were collected. Regression analysis was done using the SPSS statistical package.

Results

There was a significant difference in the mean endurance time between groups of 5-year intervals (ANOVA P<0.001) with endurance time being shorter at later testing years [figure 1]. The endurance time was significantly inversely correlated with the year of testing (Spearman's r = -0.274; P < 0.001). In contrast, there was no significant difference in the distribution of BMI between testing date 5-year intervals (P=.205) [figure 2]. A multivariate linear regression model demonstrated that the date of testing, in 5 year intervals, was independently predictive of endurance time adjusting for BMI, race and gender and age (F=14.4, p<.001). BMI was the strongest independent predictor of endurance time (F=118.8, P < 0.001), followed by race (F=30.1, P < 0.001), age (F=11.5; P = 0.001), and gender (F=6.1; P = 0.01).

Figure 1

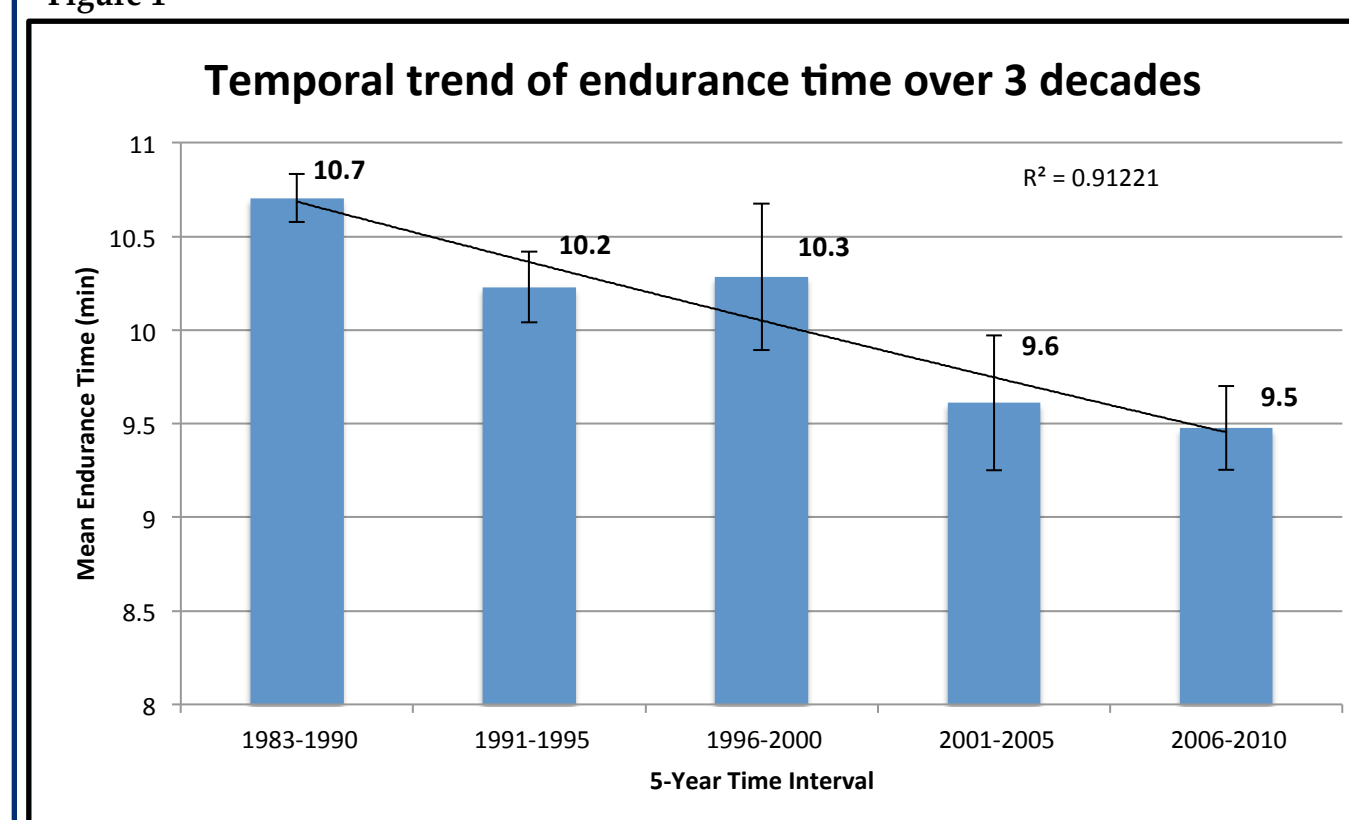
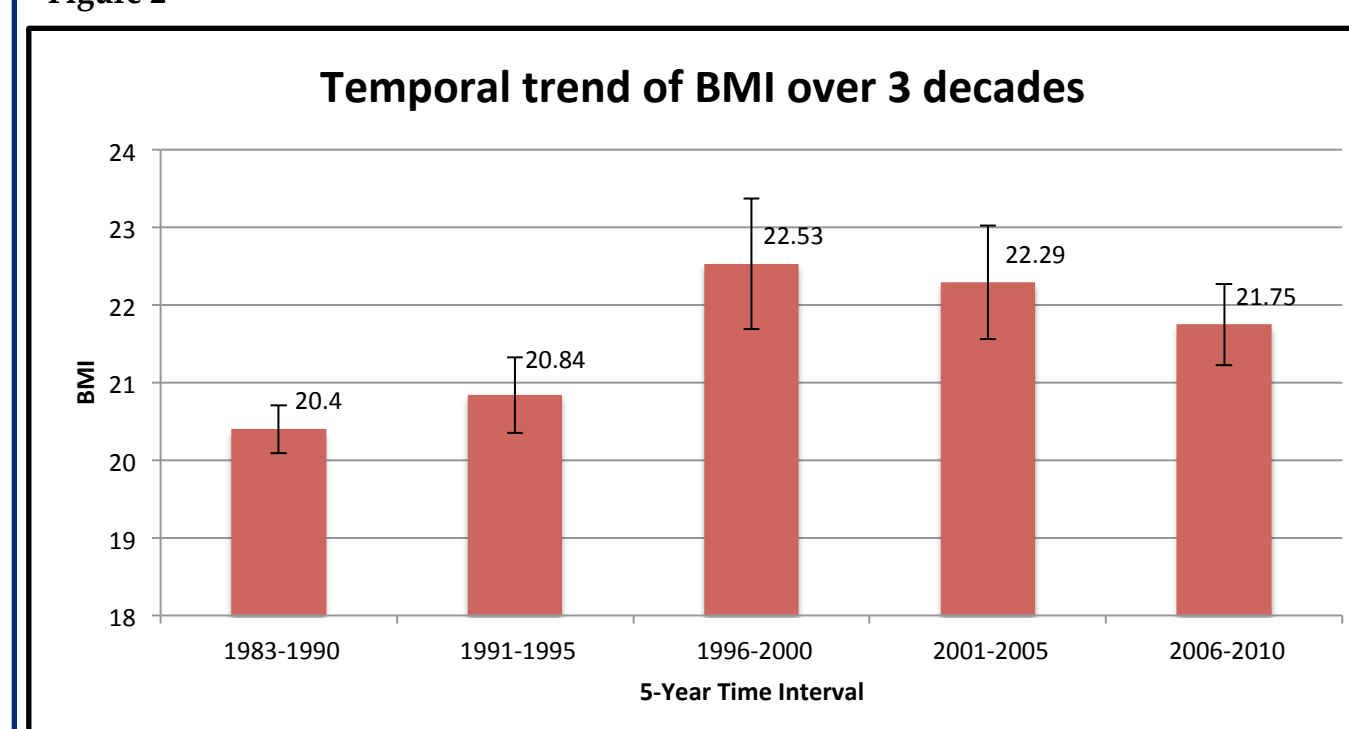


Figure 2



Bruce Protocol Treadmill Test- The subject begins walking slowly for 3 minutes at 1.7 mph on a calibrated treadmill. Speed and grade are increased every 3 minutes without any intervening rest periods at a pace established by the protocol. The individual then indicates when they are too fatigued to continue. The end point determines the subject's "endurance time." The subject may not touch the railing except with a finger or two for balance⁴.

Conclusions

There is a downward trend in endurance time over the 27 years period among inner city kids. Temporal decline in endurance time was independent of factors known to be associated with physical endurance such as BMI, age, gender, and race. BMI alone cannot fully explain the downward trend in exercise time. Thus, factors such as deconditioning due to sedentary lifestyle³ and lack of motivation to endure on the treadmill among later generations may play a role in such decline.

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Presenter's Biography

Omar Jamil is currently a first year medical student at UIC with strong interests in obesity and health disparities research. He is formerly a Teach for America corps member and looks forward to staying involved in adolescent obesity research.

Acknowledgements

Much appreciation to the John H. Stroger, Jr. Hospital of Cook County for their assistance in completing the study, and to Dr. Rami Doukky and Dr. Maria Serratto for their assistance in the data analysis.