# Tracking of Physical Activity, Cardiorespiratory Fitness and Selected CAD Risk Factors from Childhood to Adulthood: An 11-Year Follow-Up Study

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## Introduction:

Eleven years ago, we performed a comprehensive physiological evaluation on a group of Saudi children between the ages of 7 and 12 years. The aim of this study was to present follow-up assessments for physical activity, cardiorespiratory fitness (VO2 max), body fatness, blood pressure and blood lipids profile in Saudi young males, and to examine tracking coefficients for the above-mentioned coronary artery disease (CAD) risk factors over an 11-year period.

## Methods:

Subjects were 41 young Saudi males from a predominantly middle-class with good nutritional status. They were examined twice, at baseline (T1), with a mean age (SD) of 9.5 (1.5) years, and at a follow-up test (T2), with an average age (SD) of 20.5 (1.6) years. Physical activity was assessed using continuous heart rate telemetry for 12 hours on two weekdays and one weekend. For VO2 max determination, a treadmill running and an open-circuit spirometry system were used. Fat % was estimated from skinfold measurements. In addition, blood pressure measurements as well as fasting blood samples for blood lipids and lipoproteins determinations were taken from each subject.

## Results:

Paired samples t-test indicated significant increases in body mass (155.6%), lean body mass (132.9%), fat percent (49.7%), absolute VO2 max (133.8%), VO2 max relative to body surface area (30.7%), VO2 max scaled to 0.67 of body mass (26.8%), or to 0.75 of body mass (18%) and O2 pulse index (20.9%). However, there were no significant changes between T1 and T2 in VO2 max relative to body mass or relative to lean body mass. In addition, physical inactivity appeared to be the most prevalent CAD risk factors in both childhood (54.7%) and adulthood (71.1%), with an increase of almost 30% during the 11-year period. Further, Pearson correlation analyses revealed generally low tracking coefficients for moderate and vigorous physical activity as well as for VO2 max relative to body mass. On the other hand, fat%, blood pressures and most of blood lipids & lipoproteins showed significant tracking coefficients during the 11 year period, ranging from 0.35 to 0.58 (as shown in table 1).

| Variable | r | Variable | r |
|---|---|---|---|
| Activity heart rate (HR) | 0.23 | Ventilatory thresholds | 0.19 |
| Time spent > 25% HR rest | 0.39 * | Sum of skinfold | 0.58 ** |
| Time spent > 50% HR rest | 0.22 | Systolic blood pressure | 0.45 ** |
| Time spent > 40% HR reserve | 0.02 | Diastolic blood pressure | 0.24 |
| Time spent > 60% HR reserve | - 0.07 | Total cholesterol | 0.58 ** |
| VO2 max (ml/kg. min) | 0.24 | LDL-C | 0.50 ** |
| VO2 max (ml/kg. LBM. min) | 0.16 | HDL-C | 0.09 |
| VO2 max (L/min. m2) | 0.23 | Triglycerides | 0.42 ** |
| O2 Pulse Index | 0.24 | HDL-C / TC | 0.35 * |

Table 1: Pearson correlation coefficients between childhood and adulthood (** $p < 0.01$; * $p < 0.05$ ).

## Conclusion:

The percentage of obese and physically inactive Saudi youth increased substantially from childhood to early adulthood. Furthermore, contrary to fat%, blood pressure and blood lipids & lipoproteins, tracking of physical activity and cardiorespiratory fitness over an 11-year-period from childhood to young adulthood appear low.

***References:***

*Al-Hazzaa H, Sulaiman M (1993). Pediatr Exerc Sci 5: 347-356.*

*Al-Hazzaa H, et al (1993). J Saudi Heart Assoc 5: 126-133.*

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