

Supplemental Information

PHYSICAL ACTIVITY

Physical activity (PA) and participation in sports of the 9- to 18-year-old participants (1980–1989) were measured by means of a short self-report questionnaire that was administered individually in connection with a medical examination. The questions concerned the frequency and intensity of leisure-time PA, participation in sports club training, participation in competitive sports events, common activity during leisure time, school physical education grades, and type of school commute. The answers were coded from 1 to 3, with 1 representing inactivity or low activity, 2 representing moderately intensive or frequent activity, and 3 representing frequent or vigorous activity. The grade received in physical education, which has been shown to be a good predictor of PA, and commuting to school as a measure of daily activity were coded from 1 to 4. After coding, a sum index of PA was calculated. Among the 9- to 15-year-old participants, the PA index comprised 8 variables with a total score ranging from 8 to 25, and among the cohort aged 18 years, PA index comprised 5 variables with a score ranging from 5 to 15. The extra 3 variables in the questionnaire administered to the younger group were connected with going to school and did not apply to the older group (Table 1).

For participants aged 6 years, PA was measured by using parents' ratings. Parents were asked questions

concerning their child's outdoor playtime (hours in a day) in summer and in winter, the amount of PA in play as compared with other children, the vigorousness of PA, the child's enjoyment of indoor and/or outdoor play, the child's general level of activity as compared with other children, the encouragement given to participate in sports, and the patterns of PA. Each item was coded from 1 to 3, except for encouragement to engage in sport (coded as 1-2). By summing the variables, the PA index of preschool-aged children was formed with scores ranging from 8 to 23.

PARTICIPANT-SPECIFIC CURVES BY MIXED-MODEL REGRESSION SPLINES

The covariance structure for the longitudinal setting was modeled by allowing for participant-specific regression spline coefficients, which were incorporated as random effects to the model.⁴² To avoid overfitting on subject level, we reduced the number of knots on the calendar time from 1980 to 2011 for the subject-specific part from that of the fixed effects part on age from 3 to 34 years. For insulin, we reduced the number of knots on age from 3 to 34 years for the subject-specific part from that of the fixed effects part on the calendar time from 1980 to 2011. The mean profile was allowed to vary across birth cohorts and sex in terms of possibly different fixed effects parts (additionally for systolic blood pressure; the study center in the year 1980 was used). Then we evaluated

the AUC as a measure of the long-term burden of each of the measured attributes. For this study, the AUC variables were defined for childhood (6–18 years).

SUPPLEMENTAL TABLE 3 PA Questionnaire for 9- to 18-Year-Old Participants

	Points
How often do you engage in leisure-time PA for at least half an hour per session?	
Not at all	1
Less than once a month	1
Once a month	1
2–3 times a month	1
Once a week	2
2–6 times a week	2
Every day	3
How much breathlessness and sweating do you experience when you engage in PA and sport?	
Not at all	1
Moderate amount	2
A lot	3
How many times a wk do you usually engage in training sessions organized by a sports club?	
Not at all	1
Occasionally	1
Less than once a month	1
Once a mo or more	2
Once a week	2
Several hr and times a week	3
Do you participate in sports competitions?	
Not at all	1
Sports club level	2
Regional level	3
National level	3
What do you usually do in your leisure time?	
I am usually indoors and read or do other sedentary activities.	1
I spend my time indoors and outdoors.	2
I usually walk or spend time with my friends.	2
I am usually outdoors and exercise a lot.	3
The questions below apply only for participants aged 9 to 15 y old.	
Do you participate in a sports club at school?	
No	1
Yes	2
What was your grade for physical education in your last school report? ^a	
Grades 4–7	1
Grade 8	2
Grade 9	3
Grade 10	4
How far and by what means do you usually go to school?	
By car or bus	1
By bicycle <400 m	2
By bicycle <700 m or walking <400 m	3
By bicycle >700 m or walking >500 m	4
PA index total, range	8–25

^a In Finland, school-subject grades range from 4 to 10, with 4 being the lowest. The mean physical education grade is 8.

SUPPLEMENTAL REFERENCES

42. Rovio SP, Pahkala K, Nevalainen J, et al. Cardiovascular risk factors from childhood and midlife cognitive performance: the Young Finns Study. *J Am Coll Cardiol.* 2017;69(18): 2279–2289