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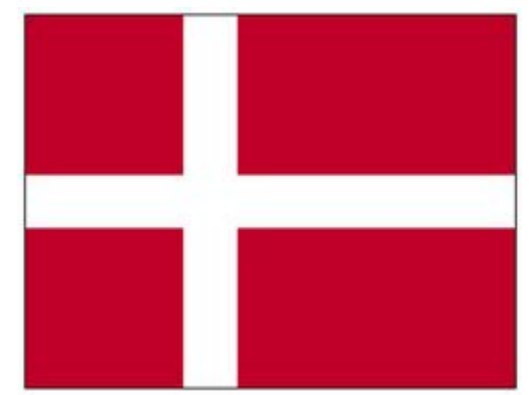
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Pedometer-determined physical activity in Danish adults considering non-ambulatory activities



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Background. Objective measurements of physical activity for surveillance are needed in Denmark.

Objective. To assess current levels of pedometer-determined physical activity (steps/day) in the Danish adult population using raw steps and steps considering non-ambulatory activities (NAA).

Methods. The study was performed in a nationally representative sample of 229 Danish adults (52% men) 15-75 years of age recruited for the 2007-2008 Danish National Survey of Dietary Habits and Physical Activity. Data of mean steps/day were collected during seven consecutive days using sealed pedometers (Yamax SW-200 Tokyo, Japan). All participants had at least four valid recording days. In addition, NAA such as cycling, swimming etc. were recorded daily in a questionnaire. Time spent on NAA was converted to step equivalents by adding 200 step equivalents/min (6 METs) using the Intermediate Conversion Method suggested by Miller *et al* (2006)¹ A pilot study showed a mean recording of 40 steps/min during moderate pace cycling (18.4 km/h). To account for this “double counting” during cycling, only 160 step equivalents/min were added per min of cycling. Addition of >10,000 step equivalents/day was truncated to 10,000 to avoid overestimation.

Table 1. Raw steps, steps considering NAA and difference between raw steps and steps considering NAA among Danish adults (mean (SD))

	Raw steps/day	Steps/day with NAA	Difference (raw vs. steps with NAA)
All (n=229)	8,912 (3,230)	10,406 (4060)	1,494* (2,094)
Men (n=120)	8,718 (3,434)	9,856 (4,120)	1,138* (1,865)
Women (n=109)	9,125 (2,991)	11,011 (3,922)	1,886* (2,264)

* P<0.001 using Student's t-test

Results. There was a significant difference of 1,494 steps/day (17%) between raw steps and steps considering NAA among Danish adults (Table 1). 36% of all adults took at least 10,000 steps/day and 54% when considering NAA (Figure 1). No significant difference in raw steps was found between genders. However, when considering NAA, women were more active than men (p=0.03). Step equivalents were added for 53% of all participants. The most frequently reported NAA was commuting by cycle, which was reported by 39% (mean 125 min/week). Truncation was carried out for 73 out of 364 conversion days (20%).

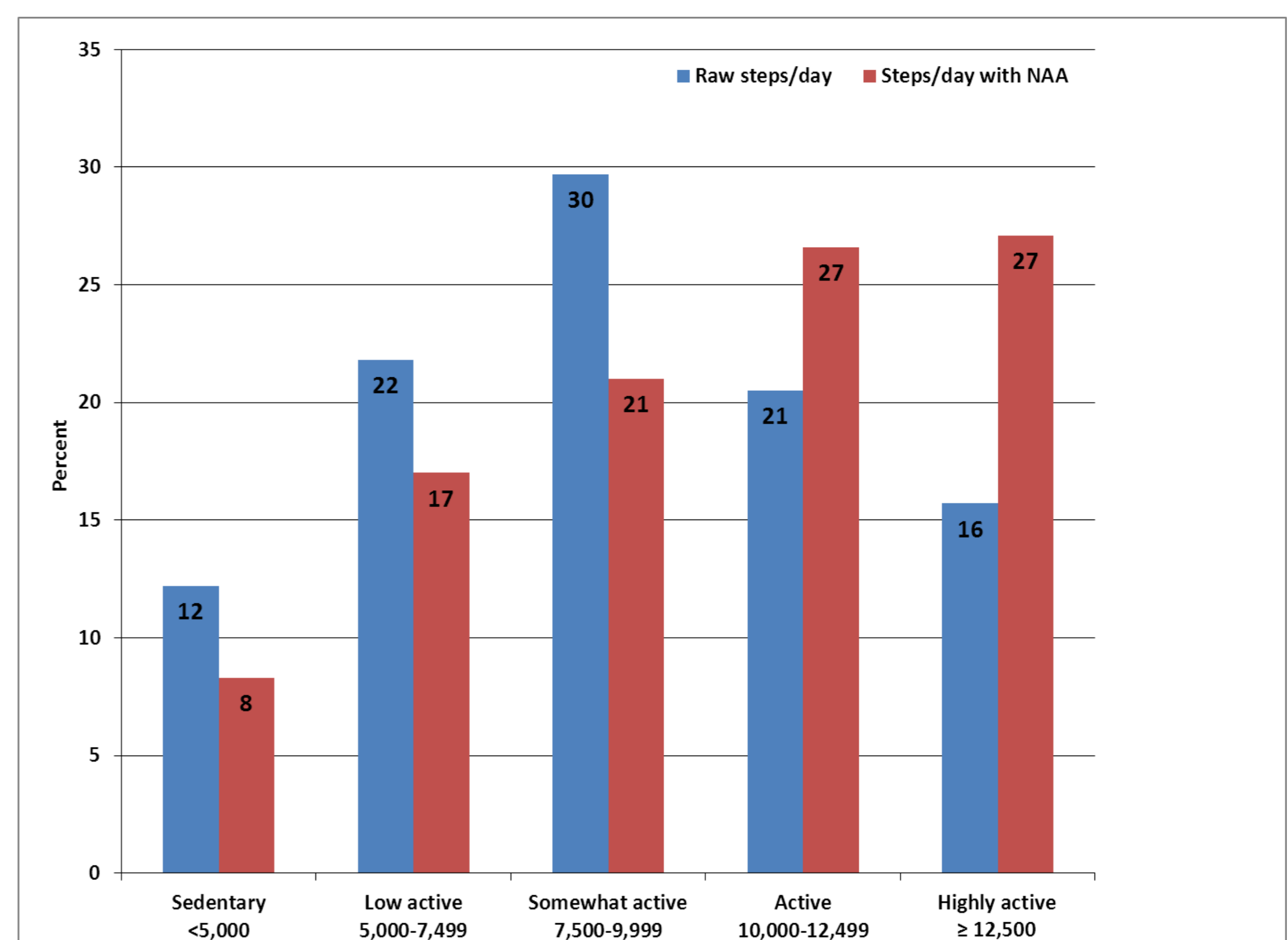


Figure 1. Danish adults categorized according to step-defined activity levels using both raw steps and steps considering NAA

Conclusion. A large part of the Danish adult population is not sufficiently active if the reasonable target is 10,000 steps/day. Commuting by cycle is a main everyday activity in countries like Denmark and to avoid underestimation of the physical activity level, NAA should be considered when assessing pedometer-determined physical activity in the general population.

¹ Miller R, Brown WJ, Tudor-Locke C. But what about swimming and cycling? How to count non-ambulatory activity when using pedometers to assess physical activity. *J Phys Act Health* 2006;3:257-266

