Physical activity as an aid for smoking cessation - PHASMO study

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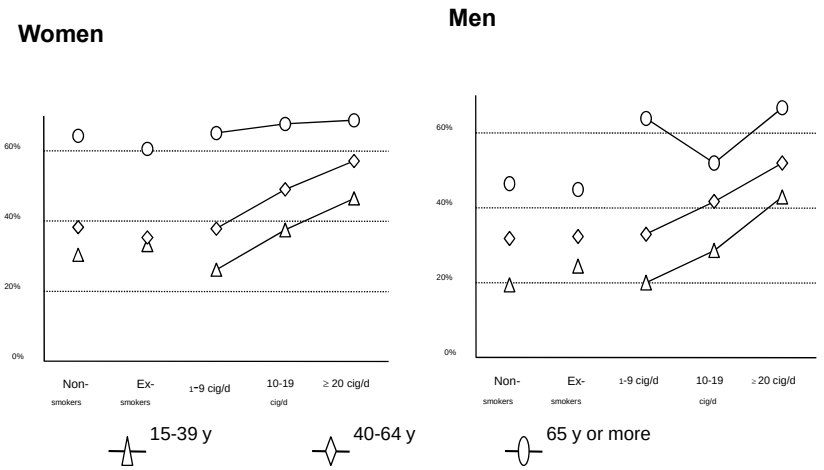
Background

- Prevalence of smoking in Switzerland: 33%
- Most smokers cumulate both risk behaviors, i.e., smoking and sedentarity.
- Prevalence of sedentary lifestyle is higher among smokers than non smokers.
- Levels of physical activity inversely related to smoking rates

Gradient of sedentary lifestyle among Swiss smokers (2002)



Working Hypothesis

- Including a tailored moderate-intensity physical activity intervention in a standard smoking cessation treatment program (pharmaceutical treatment and counseling) increases the chances of quitting and reduces nicotine withdrawal symptoms, negative moods, perceived stress, and weight gain.

Specific aims

- Main objective: to determine whether a tailored physical activity intervention involving moderate-intensity exercise is an added value to a standard smoking cessation intervention in term of likelihood of smoking abstinence.
- Secondary objectives
  - to determine whether this intervention prevents weight gain, reduces withdrawal symptoms, stress and improve mood and self-confidence in quitting
  - to assess the effect of this intervention on **lipids profil**, body composition and leptin concentration.

Methods

- Randomized controlled trial of 560 sedentary adults regular smokers recruited from the community (lay press) (Cochrane library)
- Allocated into one of the two groups (intervention group vs. control group) during a 10-week period and 2 follow-up visits (6, 12 months follow-up).
- All subjects (intervention and control groups) participate in a smoking cessation program composed of a pharmacological treatment (nicotine replacement therapy: patch and/or an inhaler) and individual counseling (Onkologie 2002, Annals Intern Med 2002).

Intervention

- The intervention group will attend the 10-week physical activity program blending moderate-intensity exercise and lifestyle physical activity and the control group a 10-week health education program to ensure equal contact condition.

Study population: Inclusion criteria

- Current daily smoker ≥10 or more cigarettes per day
- Having smoked (on average ≥ 10 cigarettes/day) regularly for at least 3 years
- Age between 18 and 65 years
- Sedentary lifestyle defined as less than 20 minutes a day of moderate-intensity physical assessed by the Swiss Baseline Questionnaire.

Exclusion criteria

- Current pharmacological agent use to quit smoking
- Medical problems that would alter training responses (arthritis, orthopedic problems)
- Presence of an unstable medical condition
- Current or recent major cardiovascular event
- Current psychiatric illness, substance abuse
- Current or planned pregnancy
- Systematic skin disease

Preliminary analysis: AIMS

1. To compare Cardiovascular Disease Risk (CVD-risk) profile between heavy smokers and regular smokers
2. To examine the hypothesis that CVD-risk is associated with number of daily smoked cigarettes
3. To asses the impact of waist circumference on CVD-risk in heavy smokers

Criteria for being at risk for cardiovascular disease (CVD)*

1. Triglycerides	**≥ 2.0 mmol/l**
2. LDL-cholesterol	**≥ 4.0 mmol/l**
3. HDL-cholesterol	**≤ 1.0 mmol/l**
4. Mean blood pressure**	**≥ 100 mm Hg**

Definition for being at risk for CVD:
When meeting **2 or more criteria**

* European Group for the Study of Insulin Resistance (EGIR). Diabet Med 1999;16:442–3.
** DBP+((SBP-DBP)/3)

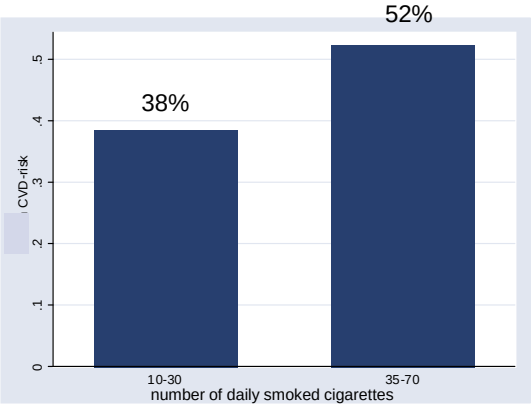
Definition of “heavy smokers”

- heavy smokers = upper **tertile** of number of daily smoked cigarettes
- Only data of first 215 male smokers here presented

Participants characteristics

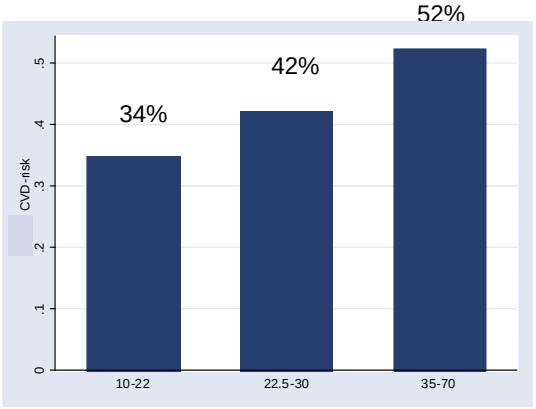
- Mean (± SD) age: **42.2 years** (± 9.4)
- Mean (± SD) number of daily smoked cig.: **29.4** (± 11.2)
- 67 (31%) heavy smokers: **35** to **70** cigarettes
- Mean (± SD) Fagerström score: **5.8** (± 2.3)
- Mean previous quit attempts: **2.8**
- 92 (43%) at CVD-risk
- Mean (± SD) BMI: **25.0** kg/m2 (± 3.6)
- Mean waist circ. (± SD): **87.5 cm** (± 9.8)

CVD-risk by categories of daily smoked cigarettes

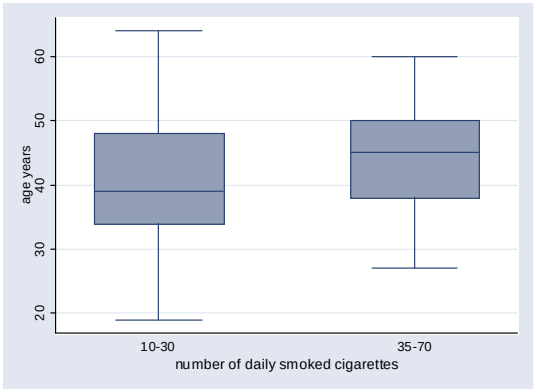


Chi2 p-value 0.06

CVD-risk by categories of daily smoked cigarettes

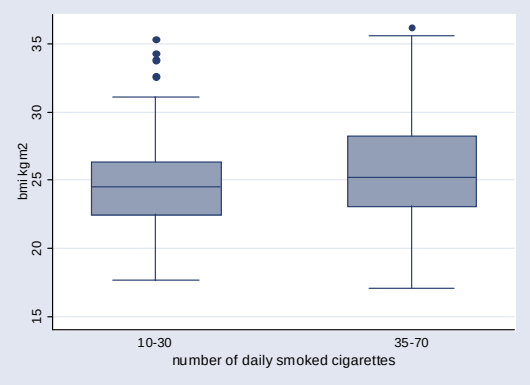


Age of heavy smokers versus regular smokers



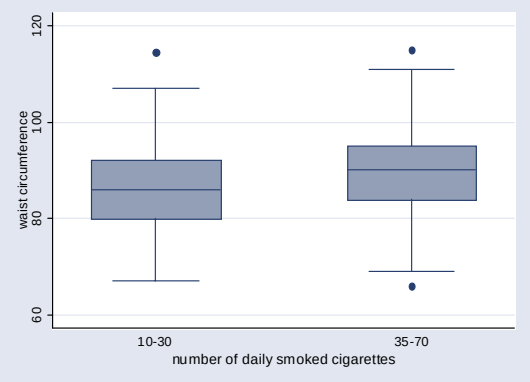
T-test p-value: 0.02

BMI of heavy smokers versus regular smokers



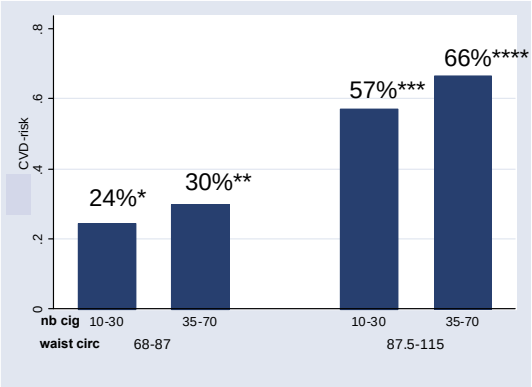
T-test pvalue 0.05

Waist circumference of heavy smokers versus regular smokers



T-test pvalue 0.002

CVD-risk profil by waist circumference and number of smoked cigarettes



*CI [15-35%]
**CI [13-50%]
***CI [44-69%]
****CI [49-80%]

The stratification for waist circumference strongly attenuates the association between being a heavy smoker and at risk for CVD (not statistically sign.)

Odds Ratio for CVD-risk*

HND smokers vs. Regular smokers			
adjustment		95% CI	N
no adj	1.74	0.97 - 3.12	215
adj for age	1.46	0.79 - 2.70	215
adj for BMI	1.44	0.77 - 2.70	211
adj for waist circ.	1.19	0.62 - 2.30	211
adj for BMI & waist	1.18	0.61 - 2.27	211
adj for Age, waist &BMI	1.06	0.54 - 2.09	211

*CVD-risk = dependent variable, independent variable = number of daily smoked cigarettes and cotinine respectively

Limitations

- Cross-sectional data
- Surrogate dependant variable (CVD-risk)
- Only men

Conclusions

- In male smokers, association of being heavy smoker and being at risk for CVD was close to significance (p=0.06).
  - Thus, even among smokers, CVD-risk appears to increase with number of cigarettes
- After adjustment for waist circumference, BMI and age, associations diminished and were not significant anymore

Conclusions

- Adjustment of waist circumference had a stronger impact on CVD-risk of heavy smokers than adjustment for BMI and age.
  - This result supports the hypothesis that CVD-risk of heavy smokers might be mediated by waist circumference.
  - Other studies show, that smoking changes body composition by increasing visceral adipose tissue and that increased waist circumference may mediate CVD-risk of smokers *

*Bigaard et al, 2003, Obes Res; Bamia et al, 2004, Int J Obes Relat Metab Disord

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