

Supplementary appendix

This appendix contains additional information about the work from authors to readers.

Supplement to: A Swedish primary health care based prevention program focusing on promotion of physical activity and a healthy lifestyle reduced cardiovascular events and mortality by Gunilla Journath, Niklas Hammar, Max Vikström, Anette Linnarsjö, Göran Walldius, Ingvar Krakau, Peter Lindgren, Ulf de Faire, and Mai-Lis Hellénus.

Supplementary appendix

A Swedish primary health care based prevention program focusing on promotion of physical activity and a healthy lifestyle reduced cardiovascular events and mortality

Table of Contents

List of Steering Committee members.....	3
Supplement 1. Organization and content of the lifestyle intervention in the cardiovascular prevention program	4
Table S1. Characteristics of the intervention group at baseline.....	6
Table S2. Baseline characteristics of the intervention group compared with the reference group before propensity score matching.....	7
Table S3. Components in charlson index of the intervention and the reference group after propensity score matching.....	8
Table S4. Cardiovascular pharmacotherapy in men, in the intervention and the propensity score matched reference group, year 2005, and year 2011.....	9
Table S5. Cardiovascular pharmacotherapy in women, in the intervention and the propensity score matched reference group, year 2005, and year 2011.....	10
Table S6. Saved lives in the intervention group.....	11
Figure S1. Risk of first cardiovascular event, cardiovascular death, and all-cause death in men and women in the intervention group compared with men and women in the reference group.....	11

List of Steering Committee members

Mai-Lis Hellénus, M.D, Ph.D., (chair), Unit of Cardiology, Department of Medicine, Karolinska Institutet, Stockholm, Sweden;

Gunilla Journath, Ph.D., (project leader), Unit of Cardiology, Department of Medicine, Karolinska Institutet, Stockholm, Sweden;

Niklas Hammar, Ph.D., Unit of Epidemiology, Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden;

Max Vikström, M.Sc., Unit of Cardiovascular and Nutritional Epidemiology, Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden;

Göran Walldius, M.D., Ph.D., Unit of Epidemiology, Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden;

Ingvar Krakau, M.D., Ph.D., Unit of Clinical Epidemiology, Department of Medicine, Karolinska Institutet, Stockholm, Sweden;

Peter Lindgren, Ph.D., Medical Management Center, Department of Learning, Information, Management and Ethics, Karolinska Institutet, Stockholm, Sweden; and The Swedish Institute for Health Economics, Stockholm, Sweden;

Ulf de Faire, M.D., Ph.D. Unit of Cardiovascular and Nutritional Epidemiology, Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden.

Supplement 1. Organization and content of the lifestyle intervention in the cardiovascular prevention program

Initial screening

A self-administered questionnaire was used for the initial screening, followed by a physical examination by a general practitioner or a nurse. Weight, height, and resting blood pressure were measured, and fasting blood samples were collected. Established guidelines for CVD prevention formed the basis for the screening as well as advice, treatment, and follow-up of identified CVD risk factors.

Lifestyle interventions

The program focused on lifestyle intervention, and advice was given individually to all participants. The at that time recently presented Strategies for the prevention of coronary heart disease – A policy statement of the European Atherosclerosis Society in European Heart Journal 1987 laid the foundation for the work. These guidelines were essentially consistent with guidelines from the AHA in the US as well as guidelines from WHO. These former guidelines are also essentially the same as current guidelines for cardiovascular prevention and lifestyle intervention.

Central components of dietary advice to reduce cardiovascular risk;

- control of overweight by decreasing energy intake and by increasing physical activity i.e. exercise suitable for the age and cardiorespiratory fitness of the individual
- reduction of total fat intake to 30% or less of total dietary energy
- reduction of the intake of saturated fatty acids to less than 10% of total dietary energy
- encouragement of the use of unsaturated fat i.e. monounsaturated oleic acid and of polyunsaturated linoleic acid

- reduction of dietary cholesterol to less than 300 mg day
- increased consumption of complex carbohydrates
- increased intake of fruit, vegetable and cereal fiber with some emphasis on legumes
- moderation in salt

Basic principles for exercise counselling;

- regular dynamic oxygen-demanding physical activity like walking, swimming, jogging, cycling and dancing
- low-intensity fitness training at a submaximal level
- regular activity at least 2-3 times a week for about 30 minutes at each session
- encouragement of daily physical activity in general

Physicians, nurses and all staff were advised to follow the guidelines. However, the physicians were free to make individual assessments regarding counselling, treatment and follow-up. Prior to the start of the program and during the first 6-7 years, education was offered to the health care personal at approximately 40 different occasions.

Supportive functions

To facilitate the work of lifestyle intervention for doctors and nurses as well as to facilitate behavioral change in the participants several supportive functions were introduced. An open lecture series on lifestyle and health as well as how to change a habit was started and operated for 17 years. The method physical activity on prescription was already used in the primary care area and the work was intensified and used extensively. After 10 years, 27 different physical activity groups run in co-operation with a local sports club could be offered to participants each semester. Group activities for smoking cessation, cooking and stress management were also available periodically.

Table S1. Characteristics of the intervention group at baseline.

Variable	N	Mean (SD)
BMI, kg/m ²	4791	24.8 (4.0)
Waist/hip ratio	974	0.8 (0.1)
Systolic blood pressure, mmHg	5139	129.3 (19.3)
Diastolic blood pressure, mmHg	5134	79.3 (10.6)
Total cholesterol, mmol/l	4951	5.6 (1.3)
Fasting triglycerides, mmol/l	4857	1.4 (1.0)
HDL-cholesterol, mmol/l	438	1.3 (0.4)

BMI, body mass index; HDL, high-density lipoprotein; and SD, standard deviation.

Table S2. Baseline characteristics of the intervention group compared with the reference group before propensity score matching.

Variable	Intervention group n=5853	Reference group before PS matching, N=1,422,551
Female, %	64.3	52.2
Age, years (SD)	45.5 (13.6)	42.5 (19.3)
Married, %*	65.4	41.2
Born in Sweden, %	85.0	81.9
Sick leave before inclusion, %	77.0	43.7
Sick leave within the last year before inclusion, %	59.6	46.0
Charlson index (SD)	0.2 (0.6)	0.3 (0.7)
Education <10 years (low), %†	25.8	34.9
Education 10–12 years (medium), %	43.3	41.5
Education >12 years (high), %	30.9	23.6
Year of inclusion,	%	%
1988	17.3	18.0
1989	29.5	30.7
1990	25.9	27.0
1991	13.8	14.3
1992	11.0	7.4
1993	2.4	2.5

*Missing data for marital status were included in the non-married group (intervention group 0.9%, reference group 0.1%). †Missing data for education level were included in the low education group (intervention group 2.0%, reference group 6.8%).

PS, propensity score; SD, standard deviation.

Table S3. Diagnoses included in Charlson Index in all, male and female intervention, and reference group.

Variable	Inter- vention all	Refer- ence all	Inter- ventio n men	Refer- ence men	Inter- vention women	Refer- ence women
n	5 761	34 566	2087	12742	3674	21824
Angina (%)	0.3	0.6	0.6	1.05	0.1	0.3
Congestive heart failure (%)	0.5	0.7	0.4	0.9	0.5	0.6
Peripheral vascular disease (%)	0.2	0.2	0.3	0.3	0.1	0.1
Cerebrovascular disease (%)	1.2	1.2	1.7	1.0	0.8	1.5
Dementia (%)	0.1	0.2	0.1	0.2	0.1	0.2
Chronic pulmonary disease (%)	3.9	3.5	3.7	3.3	4.0	3.7
Rheumatic disease (%)	0.4	0.5	0.4	0.5	0.3	0.5
Peptic ulcer disease (%)	0.7	0.9				
Mild liver disease (%)	0.0	0.0	0.0	0.0	0.0	0.0
Diabetes without complications (%)	1.0	0.9	0.9	0.9	1.0	0.9
Diabetes with complications (%)	0.0	0.0	0.0	0.0	0.0	0.0
Paraplegia and hemiplegia (%)	0.0	0.1	0.1	0.0	0.0	0.0
Renal disease (%)	0.3	0.2	0.2	0.3	0.4	0.2
Cancer (%)	8.0	8.6	8.6	9.9	7.7	7.8
Liver disease (%)	0.1	0.0	0.2	0.1	0.0	0.0
Metastatic carcinoma (%)	0.2	0.3	0.2	0.2	0.1	0.3
AIDS/HIV (%)	0.0	0.0	0.0	0.0	0.0	0.0

Table S4. Pharmacotherapy in the intervention and reference group in men year 2005 and year 2011.

Variable	Intervention group men, year 2005	Reference group men, year 2005	Intervention group men, year 2011	Reference group men, year 2011
n*	1861	11001	1694	9969
Lipid lowering, (%)	19.5	14.4	28.0	22.4
Antihypertensives, (%)	40.1	31.8	52.7	45.0
Diuretics, (%)	12.1	9.7	16.2	13.0
Betablockers, (%)	20.3	16.8	27.1	22.2
CCB, (%)	10.2	8.2	17.1	13.9
RAAS inhibitor, (%)	19.3	14.8	33.2	27.7
Antidiabetics, (%)	8.3	6.8	11.4	9.8
Insulin, (%)	3.8	2.9	5.6	4.4

*number still alive in year 2005 and 2011 respectively

CCB, calcium channel blockers; RAAS, renin angiotensin aldosterone system

Table S5. Pharmacotherapy in the intervention and reference group in women year 2005 and year 2011.

Variable	Intervention	Reference	Intervention	Reference
	group	group	group	group
	women, year	women, year	women, year	women, year
	2005	2005	2011	2011
n*	3421	19961	3210	18601
Lipid lowering, (%)	15.2	10.5	22.9	16.8
Antihypertensives, (%)	37.5	30.3	50.5	42.9
Diuretics, (%)	13.5	12.3	18.1	16.0
Betablockers, (%)	18.4	14.9	24.2	19.8
CCB, (%)	8.6	6.7	15.1	11.9
RAAS inhibitor, (%)	13.6	10.4	26.1	22.2
Antidiabetics, (%)	5.0	3.8	7.4	5.6
Insulin, (%)	2.3	1.8	3.2	2.4

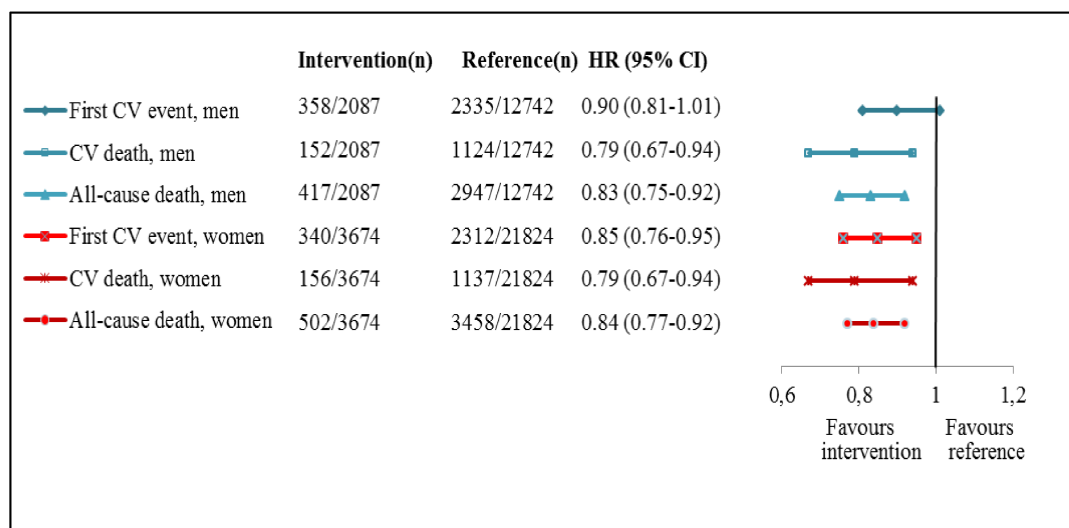
*number still alive in year 2005 and 2011 respectively

CCB, calcium channel blockers; RAAS, renin angiotensin aldosterone system

Table S6. Saved Lives in the Intervention Group.

Variable	All-cause death in the intervention group	CV death in the intervention group
Observed cases	919	308
Expected cases	1094	386
Saved lives	175	78
Saved lives per 10,000/year	15	7

CV: cardiovascular.

**Figure S1.** Risk of first cardiovascular event, cardiovascular death, and all-cause death in men and women in the intervention group compared with men and women the reference group.

CI denotes confidence interval, CV cardiovascular, n numbers, HR hazard ratio.