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Did a health dialogue matter? Self-reported cardiovascular disease and diabetes 11 years after health screening

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Abstract

Objective. To study the potential impact of health screening, with or without a motivational health dialogue, on the risk and morbidity of cardiovascular diseases (CVD) and diabetes (DM). **Design.** Two cross-sectional studies with an interval of 11 years. **Setting.** The community of Härnösand, Sweden. **Subjects.** In the first study, 402 men born in 1934, 1944, or 1954 underwent health screening for CVD prevention in 1989. In the second study, 415 men (of the same ages) completed a questionnaire in 2000 (11 years later). **Main outcome measures.** Odds ratio (OR) for self-reported CVD and DM. **Results.** The odds ratio of self-reported CVD and DM was more than doubled among participants in the health screening without a health dialogue (OR 2.5; 95% CI 0.8–7.4) and threefold for those not participating (OR 3.0; 95% CI 1.0–8.8) compared with those who reported participation in health screening that included a structured health dialogue. **Conclusions.** Health screening for the prevention of CVD and DM benefits from inclusion of a structured, motivational health dialogue.

Key Words: Cardiovascular diseases, counselling, health surveys, lifestyle, primary healthcare, primary prevention, risk factors

Many cardiovascular disease (CVD) prevention programmes focus on promoting a healthy lifestyle. Positive effects of a combined approach (population and high-risk) have been reported by numerous authors in both intervention and observational studies [1–5].

Health education, counselling, and health dialogue have always been tools in primary healthcare (PHC) as well as other preventive efforts and health promotion. The efficiency of health dialogue in CVD prevention efforts has been sparsely studied. Some authors have compared interventions with or without health dialogue in tobacco cessation [6] as well as alcohol use [7]. There are CVD prevention interventions with health education or counselling as an essential component that show favourable effects on risk factors [3,5,8]. Positive effects of health dialogue on CVD risk were found in Ebeltoft, Denmark [9] and on CVD mortality in Habo,

As cardiovascular diseases (CVD) remain a major cause of premature death, there is a need for improved preventive efforts.

- Men who participated in and remembered a motivational health dialogue reported lower frequency of CVD and DM 11 years later.
- Health screening for prevention of CVD and DM benefits from inclusion of a structured, motivational health dialogue.
- Optimal structure and design of a health dialogue needs to be further evaluated.

Sweden [10]. However, no papers report whether the structure and content of a health dialogue has an added value on outcome.

The Härnösand Community Intervention Programme (HCIP), a small-scale programme

conducted during 1987–1995 for the prevention of CVD, integrated a population-oriented approach with an individual high-risk approach and focused on middle-aged men [11]. Briefly, all men aged 35, 45, or 55 were invited by their PHC providers to a health screening that included objective measurements, a comprehensive questionnaire, and standardized health counselling by trained PHC nurses. The counselling consisted of a structured, motivational health dialogue that included a discussion of the individual's CVD risk, possible and desirable lifestyle changes, and referral to PHC when needed. This initial screening and counselling lasted 60–90 minutes. Parallel to this, other providers (mainly Occupational Health Services, OHS) in the same community carried out opportunistic health screenings without a structured health dialogue.

The aim of this study was to explore the extent to which participation in health screenings with different designs (with or without a health dialogue) might influence CVD and diabetes morbidity as measured by self-reported presence of these diseases in a cross-sectional study of middle-aged men with 11 years of follow-up.

Materials and methods

In 2000, a questionnaire was distributed to all men born in 1934, 1944, or 1954 and living in Härnösand municipality ($n=532$). Most of these men were invited to a health screening within the Härnösand Community Intervention Programme (HCIP) in 1989, and 72% of those invited in 1989 participated in HCIP ($n=402$) that year. The proportions of men in each age group in the general population and in the present study did not differ significantly between 1989 and 2000.

The design of the health dialogue is briefly described above and more fully in a previously published report [11]. Other health surveys (within OHS) at that time included assessments and a brief health discussion with a nurse.

The questionnaire included questions about sociodemographic factors, and participation in HCIP during 1989 or in any other health surveys since 1989. Questions about lifestyle variables (use of tobacco, alcohol consumption, physical activity, height, weight, type of milk and fat used) and about presence of CVD and/or diabetes mellitus (DM) were included. CVD was defined as ischaemic heart disease (IHD, included myocardial infarction and angina pectoris) and/or high blood pressure (HBP) and/or stroke. The alternative answers for these diseases and for the following question if any of these had been diagnosed since 1989, were "Yes" or

"No". If the participant answered "Yes", he was asked to give the name of the disease(s).

The question about participation in health screening was answered as "Yes", "No", or "Don't know." Those who were unsure if they participated in the HCIP programme and/or in other health screening were excluded from the five study groups below. *Total* includes everyone who completed the questionnaire in 2000. *Dialogue* includes those who reported participation *only* in HCIP in 1989. *No Dialogue* includes those who reported participation *only* in a health screening other than HCIP. *Both* include those who reported participation in *both* HCIP and another health screening. *Non-participation* includes those who reported that they did not participate in health screening. *Healthy* was defined as the absence of self-reported CVD and DM.

Statistics

Questionnaire answers were entered and analysed in SPSS, version 14.0. Multivariate logistic regression was used to analyse the association between participation group and self-reported outcome while controlling for socioeconomic factors, smoking, and body mass index (BMI) (considered as confounders). The significance level was defined as $p < 0.05$. Confidence intervals intended for stratified samples were measured and presented together with the proportions. Chi-squared tests were used to test for overall significant differences between sociodemographic and self-reported lifestyle factors. The local data register administrator approved the study as a part of an evaluation of quality within the PHC framework.

Result

Altogether 429 (81%) men completed questionnaires; 387 (90%) lived in Härnösand in 1989. Fourteen questionnaires were incomplete and treated as missing. A total of 314 men (76%) participated in some type of health screening during the study period; 151 (36%) stated that they participated in HCIP in 1989, 124 (30%) did not know, and 140 (34%) reported that they did not participate in HCIP. Others had participated in other health screenings ($n=243$). Some did not participate in any health screening ($n=63$). The distribution and groupings are presented in Table I. Chi-squared showed $p \leq 0.001$ for overall effect (no specific differences between groups).

Sociodemographic and self-reported lifestyle factors in 2000 are presented in Table II. There were significant differences in sociodemographic data (domicile, work) and some self-reported lifestyle

Table I. Summary of questionnaire respondents' health screening participation (n=415; $p \leq 0.001$ for overall effect).

		Other health screening			Total
		Yes	No	Unsure	
Härnösand	Yes	80 ¹	69 ²	2	151
Community	No	74 ³	63 ⁴	3	140
Intervention	Unsure	89	26	9	124
Programme	Total	243	158	14	415

Notes: ¹ = Both, ² = Dialogue, ³ = No Dialogue, ⁴ = Non-participation.

factors (dairy, overweight). There were no significant differences in the variables of family, tobacco, and physical activity.

At baseline (1989) the only significant difference in proportions of healthy men within the health screening groups was among those participating in more than one screening (*Both*). These results are presented in Figure 1.

On comparison of the 11-year changes within participation groups, the *Dialogue* and *Non-participation* groups showed no significant decline in health from 1989 to 2000. The other groups showed nearly identical, substantial declines in health. The total reported number of cases of disease were 147 (IHD, n=40; HBP, n=80; stroke, n=10; DM, n=17), 72

(49%) of which had developed since 1989 (IHD, n=26; HBP, n=29; stroke, n=5; DM, n=11). The incidence of CVD/DM was in *Dialogue* 8.1% (CI 1.3–14.8), in *No Dialogue* 22.6% (CI 12.2–33.0), in *Both* 16.9% (CI 8.5–25.3), in *Non-participation* 19.2% (8.4–30.0) and in *Total group* 19.1% (CI 15.1–23.1). The difference between the *Dialogue* and *Total* groups was significant. Chi-squared for incidence difference between HCIP participants (*Dialogue + Both* + two unsure) and HCIP non-participants (see Table I) was 4.75 ($p = 0.03$).

When comparing the risk for CVD/DM (expressed in Odds Ratios, OR) for healthy men during the study period, the OR for *No Dialogue* was 2.5 (CI 0.8–7.4), for *Both* was 2.1 (CI 0.7–6.7) and for *Non-participation* was 3.0 (CI 1.0–8.8) compared with the *Dialogue* group. The CI intervals show that the difference between the *Non-participation* and *Dialogue* groups was significant.

Discussion

A conservative interpretation of this study is that men who participated in health screening that included a motivational health dialogue reported lower frequency of CVD and/or DM 11 years later compared with men who had health screenings without a health dialogue. The risk for CVD/DM was more than

Table II. Self-reported data in different health screening groups in 2000: proportions (%).

Subject	Answer	Dialogue n=69	No Dialogue n=74	Both n=80	Non-participation n=63	Total n=415
Domicile $p \leq 0.001$	Same as 1989	100	78.4	98.8	71.4	90.2
Family $p = \text{n.s.}^*$	Married	85.3	68.9	81	84.1	78.9
	Children	89.9	81.1	84.6	88.9	85.9
Work $p \leq 0.001$	Blue collar	25.9	30.5	44.9	25.5	33.2
	Other	16.4	18.1	15.4	16.9	14.7
	None or retired	38.8	19.4	14.1	33.9	23.1
Tobacco $p = \text{n.s.}^*$	Daily smoking	20.2	23.6	17.6	25.4	19.4
	Daily snuff use	17.9	20	20.8	24.6	20.7
Physical activity $p = \text{n.s.}^*$	Active > 30 min/week	59.4	62.5	59	49.2	59.2
Dairy consumption $P \leq 0.05$	Milk 0.5% fat	18.8	23.6	31.3	19	24.8
	Milk 3% fat	15.9	18.1	12.5	28.6	14.8
	Low fat/none on bread	71	60.6	63.6	57.1	65.6
Overweight $p \leq 0.01$	BMI 25–29	61.7	53.6	57.9	51.9	54.1
Obesity	BMI ≥ 30	6.7	8.7	19.7	22.2	14.5

Note: *n.s. = not significant.

Figure 1. Proportions (%) of healthy individuals by health screening groups in 1989 and 2000.

doubled for all other groups in this study compared with those who reported participation in health screening with a structured health dialogue.

This study was performed in a geographically stable general population: 28% of the population and 10% of participants in follow-up had changed their domicile during the 11 study years. Due to this fact, participation rates of 72% in 1989 and 81% in 2001, and no significances between groups with regard to the sociodemographic factors, we think it is reasonable to generalize the results to men in the studied age group, with the caution that there were small numbers in the groups. In our classification of study groups we excluded everyone who was unsure of previous participation in any health screening. This approach reduces the risk of diluting or overestimating results. Together with the high response rate (81%), this could be interpreted as a strength of the current study.

One major concern is that this study is based on self-reported health information, including self-reported prevalence of CVD and diabetes. This may risk underestimation (e.g. concerning weight, consumption of dairy, alcohol, or tobacco), overestimation (e.g. concerning height or physical activity), and recall bias. The true prevalence of diabetes and high blood pressure might be higher than self-reported, and the prevalence of angina pectoris might be overestimated. We think it is reasonable to assume that these possible biases do not differ between the groups. Furthermore, self-rated health information is known to be useful [12,13] because it gives the healthcare provider insight into the participant's view of health and life conditions. Such information is useful when providing a motivational health

dialogue. Self-reported frequencies of DM and the calculated incidence in our study are approximately the same as a former study in the area [14] and the incidence of CVD approximates that of regional data.

An additional concern is whether any of the groups of men were healthier in 1989, but only the *Both* group reported less CVD/DM in 1989. CVD/DM health declined from 1989 to 2000 in all groups, as would be expected in an ageing population [15]. However, the decline was *not* significant in the *Dialogue* and *Non-participation* groups. These findings support the interpretation that these groups maintained CVD/DM health to a greater extent. We also found that men in the *Dialogue* group reported fewer new CVD events (IHD, HBP, stroke) and DM, but after adjustment for confounders, the differences were significant only between *Dialogue* and *Total* groups. An interesting observation is that those who participated in the *No Dialogue* group had a higher incidence of CVD/DM than the *Non-participation* group. Could a health screening without a structured health dialogue be harmful or reduce the intended effect of health screening? We made the assumption that the probability of remembering a health dialogue increases when the health issues and discussion provide motivation and inspiration to make lifestyle changes, and that those who remember that they took part in a health dialogue had an effect on future CVD and DM.

One issue with our analysis is that some differences between our groups were not statistically significant, and this is at least partly due to the small numbers in the groups. The fact that there were significant differences in the OR between the *Dialogue* and *Non-participation* groups in reduction of CVD/DM health, between *Dialogue* and *Total* groups (and between HCIP participants and HCIP non-participants) in CVD/DM incidences, and between *Dialogue* and *Non-participation* groups strengthens our interpretation that participation in the *Dialogue* group was favourable and had some impact on future CVD/DM health.

The long latency between risk acquisition and disease development is one reason why evaluations need to be of long duration [16]. Even an 11-year study period may be too short to detect changes in risk factors and morbidity, especially in small populations. Our study could be seen as an effort to explore CVD/DM risk in a population targeted by a previous CVD prevention programme. Some authors express doubt about the efficiency of preventive efforts and therefore new evaluation methods have been requested [17–19]. Recent studies have explored the intervention process itself [16,20] and highlighted knowledge and theories behind lifestyle

changes, implementation, and dissemination, as well as behaviour change theories [21,22]. Some authors describe positive results within their prevention programme attributable to a health dialogue about risk factors and lifestyle [9,10]. Our findings are similar, although we focused on the structured health dialogue. To date, no published studies have identified and compared different structures or contents of a health dialogue.

Conclusions

This study supports the hypothesis that use of health screening that includes a structured, motivational health dialogue is more effective than health screening without a health dialogue. We suggest that a structured health dialogue be included in future CVD health screenings. Such a health dialogue might also be a useful tool in general health service; however, the optimal structure and motivational component of health dialogues need to be studied further.

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