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RESEARCH PAPER

Impact of different aspects of social participation and social capital on smoking cessation among daily smokers: a longitudinal study

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Objective: To investigate differences in different aspects of social participation and social capital among baseline daily smokers that had remained daily smokers, become intermittent smokers, or stopped smoking at one year follow up.

Design/setting/participants/measurements: 12 507 individuals, aged 45–69 years, interviewed at baseline between 1992 and 1994 and at a one year follow up were investigated in this longitudinal study. The three groups of baseline daily smokers were compared to the reference population (baseline intermittent smokers and non-smokers) according to different aspects of social participation and social capital. A multivariate logistic regression model was used to assess differences in different aspects of social participation and social capital.

Results: The baseline daily smokers that remained daily smokers at the one year follow up had significantly increased odds ratios of non-participation in study circles in other places than at work, meeting of organisations other than unions, theatre/cinema, arts exhibition, church, sports events, large gatherings of relatives, and private parties compared to the reference population. The baseline daily smokers that had become intermittent smokers at the one year follow up had significantly increased odds ratios of non-participation in church services. The baseline daily smokers that had stopped smoking had increased odds ratios of non-participation in having attended a meeting of organisations other than labour unions during the past year, having been to a theatre or cinema, and of having visited an arts exhibition during the past year. All three categories of baseline daily smokers had significantly decreased odds ratios of non-participation in night club/entertainment.

Conclusions: The baseline daily smokers that had remained daily smokers at the one year follow up had particularly high rates of non-participation compared to the reference population in both activities specifically related to social capital, such as other study circles, meetings of organisations other than labour unions, and church attendance and cultural activities such as theatre/cinema and arts exhibition, although significantly lower participation in cultural activities and meetings of other organisations was also observed among daily smokers that had stopped smoking. All three baseline daily smoker groups had higher rates of having visited a night club during the past year.

Cigarette smoking is now a major public health concern in both developed and developing countries.^{1,2} The prevalence of smoking has declined in most developed countries in recent decades,³ and in Sweden there has been a continuous decrease in smoking prevalence among men since the 1960s.⁴ The decrease in smoking prevalence among women has been more moderate.⁵ Smoking is now strongly associated with low socioeconomic status.^{3,6}

Smoking cessation is a complex process that involves social, psychological, as well as biological factors.^{7–10} Tobacco smoking is a result of both biological nicotine dependence and the interaction between a person and his/her environment. The relation with the environment is a dynamic process. Changes in the environment require both individual resources and social relations—for example, social network and social support.^{11,12} Previous studies in Malmö have operationalised the individual's access to social networks as a social participation index consisting of different organisational, cultural, and other social activities and a social anchorage index consisting of closer social networks such as neighbourhood, relatives, social contacts in the workplace, and close friends. The access to closer social support was operationalised as instrumental (practical) support and emotional support. The studies consistently show that smoking cessation is significantly associated with high levels of social participation. In contrast, smoking cessation is not significantly associated with the

social anchorage, instrumental support, and emotional support indices.^{13,14}

Social participation is a specific concept,¹⁵ which can be interpreted either in social science terms of diffusion of information^{16,17} and the contact with the norms, rules, values and control of society,¹⁷ or in psychosocial and psychological terms theoretically^{11,12} connected with emotional and practical (instrumental) support. The lack of association between social support and smoking cessation makes the social science interpretation more plausible. Social participation is a key notion within the social capital literature.^{17–20} Social capital and social participation are of great importance for health related behaviours such as tobacco smoking because they may promote rapid transmission of health information, adaptation of health behaviour norms, and social control over deviant health related behaviours. Social participation is an empirically directly observable aspect of social capital that can be measured as either the density of organisations in a geographic area (the number of organisations and the number of members in these organisations in relation to the population size of that area), or by asking respondents to what

Abbreviations: MDCS, Malmö diet and cancer study; MSNS, Malmö shoulder-neck study

extent they are engaged in formal and informal social activities.¹⁷ However, the social participation index variable used in the previous Malmö studies includes both formal/organisational (study circle/course at workplace, other study circle course, union meeting, meeting of other organisations, church) and informal/private (night club entertainment, large gathering of relatives, private party) aspects of social capital as well as cultural activities (theatre/cinema, arts exhibition) and other social and civic activities (sports event, submitting a letter to the editor of a newspaper/journal, demonstration). The investigation of individual social participation and cultural participation factors that facilitate the process of smoking cessation thus seems to be of high priority.

Intermittent, non-daily smoking seems to be a transitional stage for many smokers. It is also related to a stronger intention to quit and a greater likelihood of having recently attempted to quit.^{21, 22} The baseline daily smokers that had become intermittent smokers at the one year follow up will consequently be analysed separately.

The aim of this longitudinal study is to assess the importance of different aspects of baseline social participation on the inclination among baseline daily smokers to either continue as daily smokers, become intermittent smokers, or stop smoking. The second assessment of the smoking status was conducted at one year follow up.

METHODS

Study population

This study is based on the Malmö shoulder-neck study (MSNS), which is a subcohort of the Malmö diet and cancer study (MDCS). Malmö is a city in southern Sweden with approximately 250 000 inhabitants. In 1990 all subjects born from 1926 to 1945, aged 45–69 years, and living in Malmö were defined as a cohort (n= 53 325) for the MDCS. The recruitment to the MDCS took place from March 1991 until September 1996. The MSNS took place between February 1992 and December 1994, and included 14 555 subjects (6489 men and 8066 women) from this cohort. Detailed information concerning the MSNS and the MDCS is given in two other articles.^{23, 24} The study cohort was approached in two ways: by postal invitation or, to a much lesser extent, by direct contact taken by the persons to be examined after a media campaign. The focus in the information given in the invitation was on the relation between diet and cancer and not on smoking or musculoskeletal problems.

All who participated in the MSNS baseline study were also invited to participate in a second examination one year later (median 12.6 months, interquartile range 12.3–13.3 months). A questionnaire was sent to all participants in the baseline study still registered in the municipality of Malmö. Information letters introduced the questionnaire, and two written reminders and finally a telephone call followed, if needed. In total 12 507 participated in the second examination giving a response rate of 86%. On their return, the questionnaires were immediately checked for missing values and completed by telephone, if necessary.

Definitions

Outcome variable

The *smoking* item in both the baseline and the one year follow up questionnaires contained four alternatives: daily smoker, intermittent (non-daily) smoker, stopped smoking, and never smoked (the two latter categories defined as non-smokers). The baseline daily smokers had at the one year follow up either remained daily smokers (daily/daily), become intermittent smokers (daily/intermittent), or had stopped smoking (daily/stopped).

The smoking item includes cigarette, cigar, and pipe smoking, but the vast majority (80.9% of all men and 97.3% of all women) were cigarette smokers.

The reliability of the smoking item was assessed by investigating the test–retest stability of 200 respondents within two weeks after the baseline examination. The test–retest stability was very high. The κ coefficient was 0.96 for all 200 respondents, 0.99 for the men and 0.94 for the women. No age differences in reliability were observed, since the κ coefficients for the smoking item was 0.97 for the < 58.1 year group and 0.96 for the > 58.1 year group.

Independent variables

The *age* of the participants was computed from birth to the first visit to the Malmö Diet and Cancer Study Center and categorised in five groups.

Country of origin—All participants born in other countries than Sweden were merged into a single category.

Marital status—Four categories were used: married (including persons cohabitating), never married, divorced, and widow/widower.

Education—Education was categorised by length of education. The respondents were classified into three groups: university degree, medium level (university studies without degree or less than three years of university studies, senior high school), and basal level (primary school, nine years or less).

Oral snuff—Nicotine consumption in the form of oral snuff is a common habit in Sweden. The prevalence of snuff intake (yes/no) was assessed.

Social participation—Social participation (during the past year) describes how actively the person takes part in the activities of formal and informal groups as well as other activities in society. The questions concerned whether the respondents had participated in the following activities or not during the past year:

- study circle/course at workplace
- other study circle/course
- union meeting
- meeting of other organisations
- theatre/cinema
- arts exhibition
- church
- sports event
- letter to the editor of a newspaper/journal
- demonstration
- night club/entertainment
- large gathering of relatives
- private party
- none of these activities during the past year.

Each of the social participation items/variables are thus dichotomous (“yes, participated”, or “no, did not participate” during the past year).

The reliability of the different social participation items has been assessed by testing the test–retest stability of 200 respondents in the MSNS study. The test–retest stability of most of the items was reasonably high. The κ coefficients were 0.63 for study circle at work, 0.70 for other study circle, 0.88 for union meeting, 0.63 for other meeting, 0.81 for theatre/cinema, 0.80 for arts exhibition, 0.85 for church, 0.69 for sports event, 0.88 for writing and submitting an article to a newspaper/journal, 0.80 for demonstration, 0.63 for night club/entertainment, 0.70 for large gathering of relatives, and 0.51 for private party.

Statistics

Three groups of baseline daily smokers that either had remained daily smokers, had become intermittent smokers, or

Table 1 Prevalence (%) of baseline smoking, sociodemographic, and social participation variables. The Malmö shoulder–neck study

	Men		Women		Total	
	n	%	n	%	n	%
<i>Smoking status</i>						
Regular/daily smoker	1606	24.8	1944	24.1	3550	24.4
Intermittent smoker	334	5.1	365	4.5	699	4.8
Stopped smoking	2725	42.0	2160	26.8	4885	33.6
Never smoked	1821	28.1	3593	44.6	5414	37.2
(Missing)	(3)		(4)		(7)	
<i>Age</i>						
45–49 years	826	12.7	1024	12.7	1850	12.7
50–54 years	1608	24.8	2027	25.1	3635	25.0
55–59 years	1501	23.1	1809	22.4	3310	22.7
60–64 years	1566	24.1	2004	24.8	3570	24.5
65–69 years	988	15.2	1202	14.9	2190	15.0
(Missing)	(0)		(0)		(0)	
<i>Country of origin</i>						
Sweden	5615	86.6	7047	87.4	12662	87.0
Other country	871	13.4	1014	12.6	1885	13.0
(Missing)	(3)		(5)		(8)	
<i>Marital status</i>						
Married	4674	72.1	5053	62.7	9727	66.9
Never married	696	10.7	646	8.0	1342	9.2
Divorced	942	14.5	1587	19.7	2529	17.4
Widow/widower	173	2.7	769	9.5	942	6.5
(Missing)	(4)		(11)		(15)	
<i>Education</i>						
University degree	841	13.0	974	12.1	1815	12.5
Medium	1370	21.1	1128	14.0	2498	17.2
Basal level	4268	65.9	5941	73.9	10209	70.3
(Missing)	(10)		(23)		(33)	
<i>Snuff consumption</i>						
Yes	451	7.0	36	0.4	487	3.4
No	6031	93.0	8007	99.6	14038	96.6
(Missing)	(7)		(23)		(30)	
<i>Study circle/work</i>						
Yes	1674	25.8	2315	28.7	3989	27.4
No	4815	74.2	5751	71.3	10566	72.6
(Missing)	(0)		(0)		(0)	
<i>Study circle/other</i>						
Yes	1134	17.5	2247	27.9	3381	23.2
No	5355	82.5	5819	72.1	11174	76.8
(Missing)	(0)		(0)		(0)	
<i>Meeting/union</i>						
Yes	1461	22.5	1718	21.3	3179	21.8
No	5028	77.5	6348	78.7	11376	78.2
(Missing)	(0)		(0)		(0)	
<i>Meeting/other</i>						
Yes	2657	40.9	2204	27.3	4861	33.4
No	3832	59.1	5862	72.7	9694	66.6
(Missing)	(0)		(0)		(0)	
<i>Theatre/cinema</i>						
Yes	3680	56.7	5364	66.5	9044	62.1
No	2809	43.3	2702	33.5	5511	37.9
(Missing)	(0)		(0)		(0)	
<i>Arts exhibition</i>						
Yes	2623	40.4	3834	47.5	6457	44.4
No	3866	59.6	4232	52.5	8098	55.6
(Missing)	(0)		(0)		(0)	
<i>Church</i>						
Yes	2737	42.2	3968	49.2	6705	46.1
No	3752	57.8	4098	50.8	7850	53.9
(Missing)	(0)		(0)		(0)	
<i>Sports event</i>						
Yes	3014	46.4	1510	18.7	4524	31.1
No	3475	53.6	6556	81.3	10031	68.9
(Missing)	(0)		(0)		(0)	
<i>Article/newspaper or journal</i>						
Yes	466	7.2	398	4.9	864	5.9
No	6023	92.8	7668	95.1	13691	94.1
(Missing)	(0)		(0)		(0)	
<i>Demonstration</i>						
Yes	435	6.7	451	5.6	886	6.1
No	6054	93.3	7615	94.4	13669	93.9
(Missing)	(0)		(0)		(0)	

Table 1 *continued*

	Men		Women		Total	
	n	%	n	%	n	%
<i>Night club/entertainment</i>						
Yes	3009	46.4	3209	39.8	6218	42.7
No	3480	53.6	4857	60.2	8337	57.3
(Missing)	(0)		(0)		(0)	
<i>Large gathering of relatives</i>						
Yes	2732	42.1	4084	50.6	6816	46.8
No	3757	57.9	3982	49.4	7739	53.2
(Missing)	(0)		(0)		(0)	
<i>Private party</i>						
Yes	5439	83.8	6938	86.0	12377	85.0
No	1050	16.2	1128	14.0	2178	15.0
(Missing)	(0)		(0)		(0)	
<i>No activity</i>						
Yes	204	3.1	239	3.0	443	3.0
No	6285	96.9	7827	97.0	14112	97.0
(Missing)	(0)		(0)		(0)	
Total	6489		8066		14555	

Table 2 Distribution (%) of different aspects of no social participation according to smoking

	Daily/daily (n=2569) (%)	Daily/intermittent (n=193) (%)	Daily/stopped (n=215) (%)	Reference population (n=9530) (%)
<i>Study circle/work</i>				
No participation	73.5	69.9	71.4	71.6
(Missing)	(0)	(0)	(0)	(0)
<i>Study circle/other</i>				
No participation	81.7	76.7	77.9	74.7
(Missing)	(0)	(0)	(0)	(0)
<i>Meeting/union</i>				
No participation	78.4	74.6	73.3	77.7
(Missing)	(0)	(0)	(0)	(0)
<i>Meeting/other</i>				
No participation	71.8	69.9	73.7	64.0
(Missing)	(0)	(0)	(0)	(0)
<i>Theatre/cinema</i>				
No participation	48.2	39.9	40.1	33.2
(Missing)	(0)	(0)	(0)	(0)
<i>Arts exhibition</i>				
No participation	66.1	54.9	59.4	51.3
(Missing)	(0)	(0)	(0)	(0)
<i>Church</i>				
No participation	64.3	58.5	54.4	50.3
(Missing)	(0)	(0)	(0)	(0)
<i>Sports event</i>				
No participation	72.1	65.8	64.5	67.6
(Missing)	(0)	(0)	(0)	(0)
<i>Article/newspaper or journal</i>				
No participation	94.8	95.3	94.9	93.9
(Missing)	(0)	(0)	(0)	(0)
<i>Demonstration</i>				
No participation	93.8	94.8	94.0	94.1
(Missing)	(0)	(0)	(0)	(0)
<i>Night club/entertainment</i>				
No participation	53.6	47.2	50.7	57.8
(Missing)	(0)	(0)	(0)	(0)
<i>Large gathering of relatives</i>				
No participation	57.6	54.9	51.2	51.6
(Missing)	(0)	(0)	(0)	(0)
<i>Private party</i>				
No participation	18.3	17.1	11.1	13.1
(Missing)	(0)	(0)	(0)	(0)
<i>No activity</i>				
No participation	95.3	96.4	97.7	97.9
(Missing)	(0)	(0)	(0)	(0)
Total	100.0	100.0	100.0	100.0

Table 3 Odds ratios and 95% confidence intervals (OR, 95% CI) of different aspects of lack of social participation among the three groups of daily smokers at baseline compared to the reference population at baseline. Men and women. The Malmö shoulder-neck study

	Daily/daily (OR, 95% CI)	Daily/intermittent (OR, 95% CI)	Daily/stopped (OR, 95% CI)
Study circle/work	1.10 (0.99 to 1.21)	0.93 (0.68 to 1.26)	0.99 (0.74 to 1.34)
Study circle/other	1.51 (1.35 to 1.69)	1.12 (0.80 to 1.56)	1.20 (0.87 to 1.65)
Meeting/union	1.06 (0.95 to 1.17)	0.85 (0.62 to 1.19)	0.80 (0.59 to 1.08)
Meeting/other	1.43 (1.30 to 1.57)	1.31 (0.96 to 1.78)	1.60 (1.16 to 2.14)
Theatre/cinema	1.88 (1.72 to 2.05)	1.34 (0.99 to 1.79)	1.35 (1.02 to 1.77)
Arts exhibition	1.85 (1.69 to 2.02)	1.16 (0.87 to 1.54)	1.39 (1.06 to 1.83)
Church	1.78 (1.63 to 1.95)	1.40 (1.05 to 1.86)	1.18 (0.90 to 1.54)
Sports event	1.24 (1.12 to 1.36)	0.92 (0.68 to 1.24)	0.87 (0.66 to 1.15)
Article/newspaper or journal	1.19 (0.98 to 1.44)	1.34 (0.68 to 2.63)	1.23 (0.67 to 2.26)
Demonstration	0.95 (0.79 to 1.14)	1.16 (0.61 to 2.20)	0.99 (0.56 to 1.75)
Night club/ entertainment	0.84 (0.77 to 0.92)	0.65 (0.49 to 0.87)	0.75 (0.57 to 0.98)
Large gathering of relatives	1.27 (1.17 to 1.39)	1.14 (0.86 to 1.52)	0.98 (0.75 to 1.28)
Private party	1.49 (1.33 to 1.68)	1.37 (0.94 to 2.01)	0.83 (0.54 to 1.27)

All odds ratios in this table are crude, unadjusted.

had stopped smoking at the one year follow up were compared to the reference population (intermittent smokers and all non-smokers at baseline) in a logistic regression model according to the 13 different aspects of social participation at baseline. The odds ratios of non-participation in these 13 different social participation activities were calculated for the daily/daily, daily/intermittent, and daily/stopped groups compared to the reference group (intermittent smokers and all non-smokers at baseline). A multivariate logistic regression model was used to assess differences in different aspects of social participation, adjusting for age, sex, country of origin, marital status, education, and snuff consumption. The statistical analysis was performed using the SPSS software package.²⁵

RESULTS

Table 1 shows that the proportions of daily and intermittent smokers at baseline were very similar among men and women. The proportion of never-smokers was much higher among women (44.6%) than among men (28.1%). On the other hand, the proportion of individuals that had stopped smoking was much higher among men (42.0%) than among women (26.8%). Men were married/cohabitating to a somewhat higher extent than women, and women were divorced and widows to a higher extent than men. On the other hand, a higher proportion of women also had only a basal level of education. Only 0.4% of all women were snuff consumers, compared to 7.0% of all men. The distribution according to age, country of origin, having participated in a study circle at work, a union meeting, having submitted an article to a newspaper/journal, having participated in a demonstration, night club/entertainment, and a private party did not differ between men and women. A higher proportion of men than women had participated in a meeting of any other organisation (than a labour union) and in a sports event during the past year. In contrast, a higher proportion of women than men had participated in a study circle other than at work, been to a theatre or cinema, visited an arts exhibition, been to church or been to a large gathering of relatives during the past year.

Table 2 shows that the group of baseline daily smokers that still smoked at the one year follow up had lower participation rates in many social activities compared to the reference population. They had a particularly high proportion of participants with no participation compared to the reference population in study circle other than at work (18.3% v 25.3%), meeting other than labour union meeting (28.2% v 36.0%), theatre/cinema (51.8% v 66.8%), arts exhibition (33.9% v 48.7%), and having attended church (35.5% v 49.7%). The baseline daily smokers that had become intermittent smokers or had stopped smoking at the one year follow up did not differ to any larger extent from the reference population in any of the social activities. All three groups of baseline daily smokers (daily, intermittent or stopped smoking at the one year follow up) had somewhat higher participation rates during the past year in the night club/entertainment activity. Previously published data have shown that the baseline daily smokers who remained daily smokers at the one year follow up to a significantly higher extent than the total population were relatively young, born in countries other than Sweden, were not married, and had a lower educational level. They were also snuff consumers to a lower extent than the rest of the population. The daily smokers that had become intermittent smokers were not married/cohabitating and were snuff consumers to a much higher extent than the rest of the population.¹⁴

The results of the unadjusted analysis shown in table 3 show that the baseline daily smokers that remained daily smokers at the one year follow up had significantly increased odds ratios of non-participation in study circles in other places than at work, meeting of organisations other than unions, theatre/cinema, arts exhibition, church, sports event, large gathering of relatives, and private party compared to the reference population. The baseline daily smokers that had become intermittent smokers at the one year follow up had significantly increased odds ratios of non-participation in church services than the reference population. The baseline daily smokers that had stopped smoking had increased odds ratios of non-participation in having attended a meeting of other organisations than labour unions during the past year,

Table 4 Odds ratios and 95% confidence intervals (OR, 95% CI) of different aspects of lack of social participation among the three groups of daily smokers at baseline compared to the reference population at baseline. Men and women. The Malmö shoulder-neck study

	Daily/daily (OR, 95% CI)	Daily/intermittent (OR, 95% CI)	Daily/stopped (OR, 95% CI)
Study circle/work	1.11 (0.99 to 1.23)	0.96 (0.69 to 1.32)	1.04 (0.76 to 1.42)
Study circle/other	1.50 (1.34 to 1.69)	1.12 (0.79 to 1.57)	1.18 (0.85 to 1.64)
Meeting/union	1.10 (0.99 to 1.23)	0.91 (0.65 to 1.27)	0.84 (0.62 to 1.15)
Meeting/other	1.37 (1.24 to 1.52)	1.26 (0.92 to 1.73)	1.63 (1.20 to 2.22)
Theatre/cinema	1.90 (1.73 to 2.08)	1.40 (1.03 to 1.89)	1.37 (1.03 to 1.83)
Arts exhibition	1.83 (1.66 to 2.02)	1.16 (0.85 to 1.56)	1.41 (1.05 to 1.88)
Church	1.70 (1.56 to 1.87)	1.33 (0.99 to 1.79)	1.12 (0.86 to 1.48)
Sports event	1.26 (1.14 to 1.40)	1.00 (0.72 to 1.38)	0.97 (0.72 to 1.32)
Article/newspaper or journal	1.14 (0.94 to 1.39)	1.32 (0.67 to 2.60)	1.25 (0.68 to 2.32)
Demonstration	1.00 (0.84 to 1.21)	1.21 (0.63 to 2.30)	1.06 (0.60 to 1.87)
Night club/entertainment	0.90 (0.82 to 0.99)	0.73 (0.54 to 0.98)	0.82 (0.62 to 1.08)
Large gathering of relatives	1.22 (1.12 to 1.34)	1.11 (0.83 to 1.49)	0.94 (0.71 to 1.23)
Private party	1.33 (1.18 to 1.50)	1.30 (0.88 to 1.91)	0.77 (0.50 to 1.18)

All odds ratios in this table are adjusted for age, sex, country of origin, marital status, education, and snuff consumption.

having been to a theatre or cinema, and of having visited an arts exhibition during the past year, compared to the reference population. All three categories of baseline daily smokers had significantly *decreased* odds ratios of non-participation in night club/entertainment compared to the reference population.

Table 4 shows that the adjustment for age, sex, country of origin, marital status, education, and snuff consumption in the multivariate analyses did not affect any of the main results of the unadjusted analyses shown in table 3.

DISCUSSION

The baseline daily smokers that had remained daily smokers at the one year follow up had particularly high rates of non-participation compared to the reference population in both activities specifically related to social capital such as other study circles, meetings of organisations other than labour unions and church attendance, and cultural activities such as theatre/cinema and arts exhibition. All three baseline daily smoker groups had higher rates of having visited a night club during the past year. The baseline daily smoker groups that had become intermittent smokers or had stopped smoking did not differ to the same extent from the reference population, although significantly higher rates of non-participation in meetings of other organisations, theatre/cinema and arts exhibition were also observed among daily smokers that had stopped smoking.

A comparison with another investigation conducted in the city of Malmö during the same time period with a higher participation rate showed a good correspondence in the same age groups concerning socioeconomic status, smoking, and social participation.¹³ The smoking prevalence is often somewhat higher among non-participants than among study participants.^{26, 27} This is confirmed in the MSNS by the fact that the prevalence of daily smoking at baseline was 24.4% among all baseline participants, but only 23.8% among those 86% of the baseline participants who also participated at the one year

follow up.^{14, 28} However, this is probably of less importance for the findings and conclusions of this study.

The validity of items assessing smoking has been analysed several times, and the results have consistently shown that self reported tobacco smoking is a valid and reliable way to measure smoking habits in a population.²⁹⁻³⁴ The test-retest stability of the smoking item within two weeks was very high, the κ coefficient indicating an extremely high reliability. Differential misclassification is not likely to have been present. Non-differential misclassification seems to be a problem of less importance in this study, since non-differential misclassification tends to attenuate true differences, and the main results of this study show clear differences between the daily smoker group and the reference population. The reliability and validity of the different social participation variables showed a good or acceptable validity and reliability.

Age, sex, country of origin, marital status, education, and snuff consumption could be confounders of the associations between the social participation variables and baseline daily smoking. Adjusting for these variables, however, only marginally affected the estimates.

The 7% prevalence of snuff consumption among men may be regarded as low compared to the prevalence sometimes reported for Sweden.⁵ However, other unpublished data from Scania in southern Sweden reveal the same prevalence of snuff use as the one reported in this study.

The longitudinal study design may be considered the most important strength of this study.

Despite the very high reliability of the smoking item, two baseline daily smokers reported at the one year follow up that they had never smoked. However, the exclusion of these two baseline daily smokers yielded the same results in the statistical analyses.

A total of 56 persons who were not smokers (two never smokers and 54 that had previously stopped smoking) at baseline had taken up daily smoking at the one year follow up. This very small number and small proportion of a total of approximately 9000 non-smokers at baseline corresponds very

well with the general notion that the age interval 45–69 years is not the primary age interval for the recruitment of new smokers.

Social participation is theoretically and conceptually an entity in its own right. The connection between social participation and health has been investigated by Baum and colleagues,¹⁵ for example. Social participation is related to both social capital¹⁷ and social support.^{35–36} Social capital is often regarded as a contextual trait of society,^{17–20} while social support is more of a factor which concerns conditions in the closer psychosocial environment of the individual. The interpretation of the results of this study could thus go in either direction, towards social science theories such as social capital and diffusion of innovations, or in the direction of social support and more psychosocial and psychological theories. A social science interpretation of the different social participation items stresses the information as well as the norms, rules, values, and control provided by social networks. A psychological or psychosocial interpretation of the social participation items stresses the theoretical connection within the psychosocial stress theory with the close emotional and practical support provided by a spouse or relatively close friends.

However, a previous study on the MSNS material clearly shows that the association between social participation and smoking/smoking cessation is isolated from social support index variables such as emotional support and instrumental support.¹⁴ Emotional support and instrumental support do not exhibit the same significant associations with daily smoking/smoking cessation as social participation. These findings may be explained by the fact that the effects of strong emotional and instrumental support from a spouse or another close friend or relation on smoking habits and smoking cessation may heavily depend on whether this very close person is a smoker or not. Good social support may thus encourage either smoking cessation or smoking continuation. This is the rationale for discussing the social participation items in relation to theories such as social capital and diffusion of innovations. High levels of social participation may be viewed as a source of knowledge, innovation, and transmission of certain values that influence smoking behaviour and the process of smoking cessation. This notion is theoretically supported by both the theory of diffusion of innovations¹⁶ and the general social capital theory.^{17–18}

The values transmitted by high levels of different aspects of social participation may of course either be such values that support the continuation of the daily smoking behaviour, or such values that initiate and enhance the process of smoking cessation. However, the relatively low prevalence of daily smoking in Sweden and in Scania in southern Sweden (less than 20%) suggests that high levels of social participation facilitate the process of smoking cessation. It is also well known that the smoking prevalence has fallen both in Sweden⁵ and in Scania^{37–38} in recent decades. This assumption is to some extent supported by the results of the statistical analyses in this study. Low levels of such aspects of social participation that constitute the formal social networks and formal social activities within the social capital literature, such as study circles other than at the workplace, meetings of other organisations than labour unions, and having been to a service in church during the past year, are significantly associated with the continuation of daily smoking (being a daily/daily smoker in our longitudinal study). The same associations are observed for the two clearly cultural activities of having been to the theatre/cinema and having visited an arts exhibition during the past year. The high odds ratios of not having been to the theatre/cinema and an arts exhibition during the past year are in accordance with previous findings that cultural activities specifically promote good health.^{39–41} Significant but lower odds ratios are also yielded for having been to a sports event, a large gathering of relatives, and a private party during the past year in the analyses.

In contrast, having visited a night club during the past year seems to be an activity that is positively associated with the continuation of daily smoking behaviour. Night clubs obviously constitute social environments that transmit values concerning smoking behaviour that deviate from the smoking behaviour values that permeate other social networks and social activities. However, visits to night clubs were also significantly more common among both baseline daily smokers that had become intermittent smokers and baseline daily smokers that had stopped smoking at the one year follow up. Night clubs represent social environments that entail all kinds of smokers. Furthermore, significantly lower participation in cultural activities and meetings of other organisations was also observed among daily smokers that had stopped smoking.

There thus seems to be a difference between all baseline daily smokers and baseline non-smokers in cultural activities and meetings of other organisations. On the other hand, attending other study circles than at work, church, large gathering of relatives, and private party thus seem to be the most important predictors of smoking cessation for daily smokers in this study. The indirect comparison of baseline daily smokers that continued to smoke at the one year follow up with baseline daily smokers that stopped smoking during the year shows that especially activities in informal social networks such as a large gathering of relatives and a private party seem to be of importance for the smoking cessation process of daily smokers.

Finally, specifically civic activities, such as having participated in a demonstration or having submitted an article to a newspaper or a journal during the past year, are not associated with daily smoking or smoking cessation. Participating in demonstrations and submitting articles have also in previous unpublished analyses been observed to be, in contrast to other social activities, unrelated to other measures of public health such as self reported health.

The different aspects of social participation and social capital are analysed separately. This procedure and statistical design is motivated by the fact that the 13 different aspects of social participation entailed in the social participation index variable have relatively low bivariate correlations with each other. The highest correlation coefficient between any two items is $r = 0.39$ between arts exhibition and theatre/cinema, $r = 0.25$ between union meeting and study circle at workplace, $r = 0.20$ between large gathering of relatives and going to church, $r = 0.20$ between going to church and theatre/cinema, and $r = 0.20$ between demonstration and union meeting. All other bivariate correlations are even weaker.⁴²

The findings of this study have implications for smoking prevention. Informal social activities such as a large gathering of relatives and a private party, as well as more formal activities such as attending church service and other study circles than at work, are positively associated with smoking cessation among daily smokers. This implies that the promotion of formal and informal social networks is justified not only from a general public health perspective, but also from a specific smoking prevention perspective, although the promotion and support of informal social networks seem more difficult than the promotion of organisations. The issue of tobacco smoking in night clubs could be addressed by smoking prohibition in public places, which of course also would have direct implications for the public health issue of passive smoking in public places.

CONCLUSION

The baseline daily smokers that had remained daily smokers at the one year follow up had particularly low participation rates compared to the reference population in both activities specifically related to social capital such as other study circles, meetings of organisations other than labour unions and church attendance, and cultural activities such as theatre/

What this paper adds

Daily smoking and smoking cessation are affected by biological, psychological, and social factors. Social participation measured as an index variable containing items concerning social activities in meetings of organisations and labour unions, study circles, cultural activities, church, attending a private party, a large gathering of relatives, and some other activities has previously been shown to be one of the psychosocial factors. In this longitudinal study each one of the 13 items included in the social participation index variable are analysed separately in order to assess their individual importance for the continuation of daily smoking and smoking cessation, respectively. The results imply that no social participation in study circles of other organisations than at work, church, sports event, large gathering of relatives, and a private party were significantly associated with the continuation of daily smoking compared to the non-smoking and intermittent smoker reference population, while no social participation in meetings of other organisations than labour unions, theatre/cinema, and arts exhibition were significantly associated with both the continuation of daily smoking and smoking cessation.

cinema and arts exhibition, although significantly lower participation in cultural activities and meetings of other organisations was also observed among daily smokers that had stopped smoking. Attending other study circles than at work, church, a large gathering of relatives, and a private party thus seem to be the most important predictors of smoking cessation for daily smokers in this study. All three baseline daily smoker groups had higher rates of having visited a night club during the past year. The baseline daily smoker groups that had become intermittent smokers or had stopped smoking did not differ to the same extent from the reference population.

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