

Counselling by Health Care Professionals: Results of a Health Survey in Sweden

Sirkka L. Elo^{*,1} and Ingvar H. Karlberg²

¹Nordic School of Public Health, Gothenburg and Department of Community Medicine and Public Health, Örebro County Council, Sweden

²Department of Social Medicine, Gothenburg University, Sweden

Abstract: The purpose of this study was to assess the perceptions in subgroups of the population on the counselling on lifestyle by health care professionals and the factors associated with this. The design was cross-sectional, based on a random sample of women and men aged 18-84 in south-central Sweden. The study was carried out in 2004 using a mail survey. Respondents who had reported at least one visit to a health care provider (and had also reported their weight and height) were eligible for this study. Multivariate logistic regression model was built to estimate odds ratios. In the area, approximately 49 percent of women and 62 percent of men who visited a health care provider were overweight or obese. Health care professionals asked those with raised BMI more often about their diet (normal-weight 14 percent, overweight 15 percent, obese 21 percent) and physical activity (PA) (normal-weight 17 percent, overweight 22 percent, obese 26 percent). Advising a change of habits showed a similar trend, although on lower levels than asking. An association with counselling about diet and PA was found for gender, age, country of birth, BMI, and weight-related comorbidities. The most notable was a strong association between health factors and reported counselling. Counselling about behaviour was strongly associated with smoking and risk-level drinking. The findings indicate that the majority of persons with lifestyle related risk factors did not receive lifestyle counselling. Obese persons, those with weight-related comorbidities, men, younger, and foreign-born people received diet and PA advice more often. The results show that further improvement of strategies for promoting a healthy lifestyle in health care settings is needed.

Keywords: Health behaviour, body mass index, preventive health services, equality.

INTRODUCTION

Individuals with body mass index (BMI = weight divided by height squared) between 25 and 29.9 kg/m² are defined by WHO as *overweight*, and those with BMI 30 kg/m² or higher are *obese* [1]. In Sweden, the proportion of obese adults has doubled since 1980, while the proportion of overweight women and men has increased by about 20 percent and 30 percent, respectively, during the same period [2]. In 2002-03, one-third of all Swedish women and over half of men between 16 and 74 years of age were overweight or obese. Obesity is more common in rural areas than in metropolitan. Obesity is associated with a higher risk of cardiovascular disease (CVD), type 2-diabetes, dyslipidemia, hospitalisation, and mortality [3, 4]. Obesity in combination with other risk factors is associated with a higher risk for CVD than obesity alone [3].

Life-style factors, such as dietary habits, physical activity (PA), and alcohol consumption are related to obesity [5-7]. Population-based cohort and case-control studies and clinical trials have demonstrated the beneficial effect of comprehensive lifestyle modifications in the prevention of weight gain and in reducing risk factors for CVD [3, 8], type 2-diabetes [9], metabolic syndrome [10], and hypertension [11]. At the population level, a small decline in the

distribution of BMI levels may have an impact on public health [6, 12, 13].

Health care professionals can play a key role in the identification, assessment, and prevention of overweight and obesity [12, 14, 15]. In addition, there is evidence for cost-effectiveness [16-18] of interventions to promote a healthy lifestyle. However, previous studies have shown that weight-related counselling is rare [19, 20]. In addition, information relating to behavioural risk factors is insufficient in the patient records and in the health care registers [20-22].

In this paper, we have studied a population in south-central Sweden who reported any visit to a health care provider. The purpose was to examine this population subgroups' perception of health care professionals' lifestyle counselling, i.e. did the health care professionals ask about lifestyle habits and give advice to change lifestyle habits, during routine consultation. Furthermore, we wanted to explore the factors associated with counselling.

METHODS

We used data from the *Life & Health 2004* survey administered by Statistics Sweden, Statisticon AB and Garantidata AB in collaboration. The method was postal questionnaires with two postal reminders. The individuals in the sample were provided pre-stamped envelopes for mailing. A random sample of 68,460 people, aged 18-84 years from 55 municipalities in five regions in south-central Sweden (Södermanland, Uppsala, Värmland, Västmanland,

*Address correspondence to this author at the Department of Community Medicine and Public Health, Box 1613, SE-701 16 Örebro, Sweden; Tel: +46 19 6027055; Fax: +46 19 6027049; E-mail: sirkka.elo@orebroll.se

Table 1. Sociodemographic Characteristics in Percentages According to Sex and BMI-Range for the Study Population 18-84 Years, i.e. those of the Underlying Population who Visited[†] Any Healthcare Provider within the Previous Three Months. Row Percent

	Women				Men			
	Number of Observation	BMI-Range			Number of Observation	BMI-Range		
		18.5-24.9	25-29.99	≥30		18.5-24.9	25-29.99	≥30
All	13,427	51.0	33.2	15.8	10 378	38.1	47.2	14.7
Age								
18-34	2 803	67.3	21.7	11.0	1 278	55.9	32.6	11.5
35-49	2 636	55.7	29.2	15.2	1 692	36.2	47.8	16.0
50-64	3 599	45.3	36.7	18.0	2 853	32.8	50.5	16.6
65-79	3 545	41.1	40.6	18.3	3 780	34.8	50.2	15.0
80-84	844	48.6	37.8	13.6	775	48.1	43.0	8.9
Education								
High	3 451	61.8	27.2	11.1	2 217	44.8	45.1	10.1
Medium	5 518	49.8	33.3	16.9	4 127	37.1	47.2	15.6
Low	4 217	44.2	37.8	18.0	3 736	34.3	48.8	16.9
Country of Birth								
Born in Sweden	11 825	51.5	33.0	15.4	9 170	38.5	47.1	14.4
Born in other Nordic countries	809	43.3	35.8	20.9	536	31.7	47.2	21.1
Born outside the Nordic countries	793	51.2	33.2	15.6	672	37.4	48.5	14.1

[†] Once or more than once.

Abbreviations: BMI calculated as weight divided by height squared, normal weight (BMI 18.5-24.9 kg/m²), overweight (BMI 25-29.9 kg/m²), and obese (BMI equal to or over 30 kg/m²).

and Örebro County), had the opportunity to participate in the survey. Gender, age group and area of residence stratified the sampling. A total of 43,589 (64 percent) returned the questionnaire. The response rate increased with age up to 80 years. Women were more likely to respond to the questionnaire than men, except in the age groups above 65 years. Non-Nordic born group have lower response rate than Nordic groups.

The individuals were informed through the covering letter that education level and country of birth from the Swedish official registries should be linked to their answers if they responded to the questionnaire. Questionnaire data were linked to register information by written informed consent. Education level was categorised into three groups: high (university/post-secondary education), medium (upper secondary education) and low (elementary/compulsory education). Since information about education was not always available for respondents aged 75 years and older, this was derived from a survey question. Country of birth was categorised into three groups: born in Sweden, born in other Nordic countries, and born outside the Nordic countries. Respondents, women (n = 13,720) and men (n = 10,448), who had reported at least one visit to a health care provider (and had also reported their weight and height) within the previous three months were eligible for this study. Subjects who reported underweight (BMI <18.5 kg/m²), women (n = 70) and men (n = 259), were excluded from the analysis.

Assessment of Health Characteristics and Behavioural Risk Factors

Respondents were asked a range of health-related questions, including self-reported weight and height. Relative weight was calculated using body mass index. In this study, the participants were grouped as Normal Weight (NW, BMI 18.5-24.9 kg/m²), Overweight (OW, BMI 25-29.9 kg/m²), and Obese (O, BMI equal to or over 30 kg/m²) based on the WHO definition [1]. Participants were categorised as having weight-related comorbidity if they reported that they had diabetes or high blood pressure during the previous 12 months.

Respondents were questioned about lifestyle habits. Physical activity was measured with a question: "How much time do you use for moderate-intensity activities during a typical week (leisure-time PA and household PA that makes one warm; for example brisk walking, gardening, various domestic activities, cycling, and swimming)?" This question is designed to estimate compliance with the Nordic public health recommendation [23] that adults and the elderly should be physically active at a moderate intensity for at least 3.5 hours per week (30 minutes every day). In this study, PA was dichotomised as ≤3 hours a week and >3 hours a week. Attitudes about dietary fat were inquired about with a question: "Do you try to avoid high fat foods?" The options were dichotomised as yes (yes, to some extent; yes, I am very particular about it) and no (not at all). Smoking

habits were established with a question: "Do you smoke?" and dichotomised as current smokers (yes, occasionally; yes, daily) or not (no, I have never smoked regularly; no, I have stopped smoking). Alcohol consumption was assessed using the Alcohol Use Disorders Identification Test (AUDIT): "How frequently do you drink alcohol?" (item 1), "How many 'glasses' do you drink on a typical day when you drink alcohol?" (item 2) and "How frequently do you drink six such glasses or more on the same occasion?" (item 3) [24].

Assessment of Counselling by Health Professionals

An initial set of questions asked about an individual's use of health care services: "Have you during the previous three months visited any health care provider?" with the list of 14 professionals. The answer options were no; yes, once, and yes, several times. Additional questions focused on two-step (Ask and Advise) in the 5As approach for health behaviour counselling [15]: (1) health professional's assessment of individuals current lifestyle status (diet, PA, smoking, and alcohol-drinking) by asking "During your latest visit, did the health care professional ask about your lifestyle habits?", and (2) professional's advising to modify lifestyle habits "During your latest visit, did the health care professional give you advice to change your lifestyle habits?" The answer options were no or yes.

Statistical Analysis

Rates for BMI in the study population were calculated from the cross-sectional data (Tables 1-3). Differences regarding distribution of characteristics between weight categories were statistically tested by Chi-square, $p < 0.05$ was considered significant. Logistic regression with the enter method (Tables 4, 5) was used to calculate multivariable adjusted odds ratios (OR) with 95 percent confidence intervals (CI) for analysing the association of sociodemographic and health related factors (exposures) with received counselling (outcome). In enter method, all variables will be included in logistic regression, whether it is significant or insignificant. All analyses were performed on SPSS (version 15.0) for Windows.

Characteristics of the Study Population

The study population, i.e. those of the underlying population who visited any health care provider within the previous three months, consisted predominantly of Swedish-born persons (88 percent). Out of the study group, 41 percent had medium-level and 33 percent low-level education. Table 1 shows the characteristics of study participants by gender and BMI group. Approximately 49 percent of women and 62 percent of men who visited any health care provider were overweight or obese.

RESULTS

Health Characteristics and Behavioural Risk Factors

Obese men, compared with those who are normal-weight and overweight, were seen by GPs (general practitioners), PHNs (public health nurses), specialty care clinics and emergency departments significantly more often (Table 2). The proportion of visits to GPs, PHNs, and emergency departments was significantly higher among obese women than among normal-weight and overweight women. There

were no statistically significant differences between weight groups in hospitalisation.

The proportions of weight-related comorbidities and lifestyle habits differed significantly across BMI groups for both genders (Table 2). The proportion of diabetes and high blood pressure increased with increasing BMI for both gender groups. Overweight and obese persons were less likely to be current smokers. The proportion of risk consumers of alcohol decreased with increasing BMI in women. A majority of the participants in the different weight groups were physically active at a moderate intensity at least 30 minutes every day (>3 hours a week) with an exception for obese women. Persons with a higher BMI were more likely to report that they had the intention of avoiding high fat foods.

Asking About Lifestyle

The health professionals asked (Table 3) obese persons at higher rates than those with lower BMI about diet (NW 14 percent, OW 15 percent, O 21 percent) and PA (NW 17 percent, OW 22 percent, O 26 percent). Rates of asking differed significantly between weight groups by sociodemographics and health characteristics, apart from the youngest and oldest persons as well as for those with diabetes and those who were less likely to try to avoid high fat foods. Women were less often given questions about diet and PA. The overall rate of asking about smoking status was 21 percent for women and 24 percent for men and current alcohol consumption 9 percent for women and 16 percent for men (not shown).

Advice to Modify Lifestyle Habits

The overall rates of advising to modify diet (NW 6 percent, OW 9 percent and O 17 percent) and PA (NW 6 percent, OW 11 percent, and O 18 percent) had a similar trend as asking about diet and PA, although on lower levels than asking. Rates of advising differed significantly between weight groups by sociodemographics (apart from for the oldest) and health characteristics. There was a similar distribution for gender as for asking about lifestyle. Compared with those reporting PA at least 3 hours a week, the rate of being advised on PA was higher for those with a sedentary lifestyle. The rate of being advised to modify diet was lower in those with less healthy dietary habits compared with those with healthier habits. The obese groups had the highest proportion of individuals receiving advice on diet and PA.

The overall rate of advice for current smokers to quit smoking was 22 percent for women and 27 percent for men (not shown). Only 7 percent of women with risk consumption of alcohol reported being advised to change alcohol-drinking behaviour compared to 14 percent of men.

Multivariate Analyses

Table 4 presents factors that were independently associated with diet and PA counselling after adjustment. A significant association was found for gender, age, country of birth, BMI, and weight-related comorbidities. The most notable was a strong association between health factors and reported counselling. Persons with obesity vs those with normal weight had 3-fold greater odds of receiving PA

Table 2. Self-Reported Use of Health Care Services, Chronic Diseases and Lifestyle Habits According to Sex and BMI-Range for the Study Population

	Women			Men		
	BMI-Range			BMI-Range		
	18.5-24.9	25-29.99	≥30	18.5-24.9	25-29.99	≥30
Number of Observation	6 850	4 458	2 119	3 954	4 896	1 528
Use of Health Care						
Primary health care visit						
General practitioner	46.9	50.4	55.1 ***	45.4	48.0	56.8 ***
Public health nurse	17.9	23.4	29.0 ***	21.3	22.9	29.0 ***
Specialty care clinic visit	24.3	24.5	26.3	29.1	29.6	32.9 *
Emergency department visit	13.6	14.4	16.7 **	17.7	16.7	20.2 *
Hospitalisation	6.0	6.4	7.7 *	8.4	7.6	8.3
Dental care visit	51.0	54.3	50.7 **	55.8	57.3	53.2 *
Private doctor visit	10.3	11.2	10.2	9.8	10.7	10.8
Chronic Diseases						
Diabetes	3.6	8.6	17.2 ***	6.4	13.0	21.6 ***
High blood pressure	15.9	30.5	39.2 ***	18.6	31.9	43.9 ***
Lifestyle Habits						
Current smoker	24.0	19.7	18.8 ***	20.2	15.9	16.9 ***
Risk consumer of alcohol	6.7	4.7	4.4 ***	4.7	4.4	5.9 *
Physical activity at a moderate intensity			***			***
>3 hours a week	62.9	57.2	45.7	64.6	63.2	50.9
≤3 hours a week	37.1	42.8	54.3	35.4	36.8	49.1
Avoid eating high fat foods			***			***
Yes	81.3	88.5	87.1	62.2	72.2	71.8
No	18.7	11.5	12.9	37.8	27.8	28.2

Data are given as percentage of respondents. *p* values are calculated using chi-square test for differences in proportions. Abbreviations: BMI calculated as weight divided by height squared, normal weight (BMI 18.5-24.9 kg/m²), overweight (BMI 25-29.9 kg/m²), and obese (BMI equal to or over 30 kg/m²).

*Statistically significant at .05 level.

**Statistically significant at .01 level.

***Statistically significant at .001 level.

advice and persons with diabetes vs those without had 4-fold greater odds of receiving diet advice and 3-fold greater odds of PA advice. Also, persons with high blood pressure had higher odds of receiving diet and PA advice than those without such condition. The adjusted odds of being counselled on diet and PA were 30 percent lower among women than among men. There was a general trend towards higher odds of counselling in younger age groups. Foreign-born persons had higher odds of receiving lifestyle counselling than Swedish-born persons.

The occurrence of behaviour counselling was strongly associated with current smoking (OR 16.23) and advice to change alcohol-drinking habits with risk consumption of alcohol (OR 5.56) (Table 5). A significant association was found for gender, age, education, country of birth, and weight-related comorbidities. Although there were the highest odds of advising to change smoking and

alcohol-drinking habits in the obese group, BMI was not significantly associated with advising.

DISCUSSION

The objective of this study was to examine the perceptions in subgroups of the population about counselling on lifestyle by health care professionals. A further objective was to examine the factors associated with counselling. Our main finding is that the professionals give diet and PA counselling primarily to persons who are obese and those with weight-related comorbidity as a form of secondary or tertiary prevention. The findings are consistent with previous population-based survey [19].

In contrast to the study by Sciamanna *et al.* [19], we found that women, apart from BMI range, were less likely to be counselled on diet and PA. The high rates of diet counselling among men may be due to the less healthy

Table 3. Fractions of Respondents who were Counsellled about Lifestyle Habits by a Professional During the Latest Visit to Health Care According to BMI-Range and Selected Characteristics

	Asked						Advised					
	Dietary Habits			Physical Activity			Dietary Habits			Physical Activity		
BMI-Range	18.5-24.9	25-29.99	≥30	18.5-24.9	25-29.99	≥30	18.5-24.9	25-29.99	≥30	18.5-24.9	25-29.99	≥30
Number of Observation	9 019	7 740	3 058	6 851	5 950	2 507	8 911	7 644	3 027	6 760	5 867	2 476
All												
	14.4	14.6	20.8 ***	17.3	21.5	26.0 ***	6.3	8.6	16.7 ***	5.7	10.5	18.1 ***
Sex												
Women	13.8	12.3	18.3 ***	15.3	18.1	23.5 ***	5.6	7.6	14.2 ***	4.8	9.4	16.2 ***
Men	15.5	16.8	24.3 ***	21.0	24.6	29.4 ***	7.5	9.6	20.2 ***	7.3	11.4	20.5 ***
Age												
18-34	21.6	20.7	23.9	20.2	21.9	24.3	9.3	9.6	18.5 ***	5.9	9.4	16.2 ***
35-49	15.3	16.0	22.6 ***	17.4	24.1	29.7 ***	4.8	8.1	16.3 ***	5.8	10.4	20.3 ***
50-64	9.4	15.0	21.3 ***	15.1	22.9	29.7 ***	4.4	8.4	17.6 ***	5.1	11.7	21.4 ***
65-79	12.0	12.4	19.0 ***	16.9	20.4	22.9 **	6.2	9.2	15.5 ***	6.0	10.5	15.7 ***
80-84	13.3	10.3	13.6	15.4	14.6	13.6	6.9	6.3	16.1 ***	5.9	7.2	8.7
Education												
High	13.2	15.4	17.2 *	16.9	24.0	22.9 ***	5.1	7.6	14.1 ***	5.0	10.3	18.9 ***
Medium	15.1	15.1	22.3 ***	18.1	21.7	28.1 ***	6.5	8.2	17.3 ***	5.1	10.1	18.6 ***
Low	15.0	13.6	21.1 ***	17.0	19.7	25.3 ***	7.2	9.6	17.2 ***	7.2	10.8	16.9 ***
Country of Birth												
Born in Sweden	14.0	13.9	20.0 ***	16.9	20.4	24.9 ***	5.9	8.1	16.2 ***	5.0	9.6	17.3 ***
Born in other Nordic countries	13.2	16.0	20.9 *	16.0	24.2	25.1 *	6.9	12.1	16.2 **	7.1	11.3	17.4 **
Born outside the Nordic countries	22.5	23.3	33.5 *	24.8	32.8	42.9 ***	12.1	13.4	25.0 ***	14.4	20.6	30.7 ***
Chronic Diseases												
Diabetes	34.8	35.0	41.9 *	37.1	41.5	45.3	17.3	25.5	35.9 ***	14.1	26.6	32.2 ***
High blood pressure	16.9	18.2	25.4 ***	21.8	25.8	30.8 ***	9.3	13.0	21.5 ***	9.3	14.4	22.3 ***
Physical Activity at a Moderate Intensity												
>3 hours a week	14.8	14.7	21.7 ***	18.0	22.4	27.2 ***	6.1	8.2	16.7 ***	4.5	9.2	16.7 ***
≤3 hours a week	13.6	14.6	20.1 ***	16.4	20.7	25.0 ***	6.3	9.2	16.7 ***	7.6	12.3	19.7 ***
Avoid Eating High Fat Foods												
Yes	14.3	14.8	22.0 ***	17.5	22.3	27.5 ***	6.1	9.1	17.5 ***	5.6	11.0	18.9 ***
No	14.6	13.5	15.9	17.0	18.1	18.7	6.7	6.7	13.3 ***	6.0	8.1	14.0 ***

Data are given as percentage of respondents. *p* values are calculated using chi-square for differences in proportions. Question on physical activity factors were asked during visit at PHC + hospital; dietary factors were asked during visit at PHC + hospital + dental care. Abbreviations: BMI calculated as weight divided by height squared, normal weight (BMI 18.5-24.9 kg/m²), overweight (BMI 25-29.9 kg/m²), and obese (BMI equal to or over 30 kg/m²).

* Statistically significant at .05 level.
 ** Statistically significant at .01 level.
 *** Statistically significant at .001 level.

dietary habits [25]. In the present study, men were less likely than women to try to avoid high fat foods, and about one third of men across BMI groups did not avoid that kind of foods. Among women, the corresponding rates were 2-2.5 times lower.

The importance of preventing weight gain early in life has been emphasised [1]. In the previous survey [19], persons below 30 and above 60 years of age were less likely to receive advice to lose weight. Somewhat unexpectedly, we found a consistent trend of increasing odds of counselling on diet and PA in younger age after adjustment for other

Table 4. Factors Associated with Professionals' Counselling about Diet and Physical Activity after Adjustment

	Asked				Advised			
	Dietary Habits		Physical Activity		Dietary Habits		Physical Activity	
Number of Observation	16 239		12 387		16 086		12 277	
	<i>p</i> -Value	OR (95% CI)	<i>p</i> -Value	OR (95% CI)	<i>p</i> -Value	OR (95% CI)	<i>p</i> -Value	OR (95% CI)
Sex	<.0001		<.0001		<.0001		<.0001	
Men		1.0 [†]		1.0 [†]		1.0 [†]		1.0 [†]
Women		0.74 (0.68-0.81)		0.69 (0.63-0.75)		0.72 (0.64-0.81)		0.75 (0.66-0.85)
Age	<.0001		<.0001		<.0001		<.0001	
18-34		1.0 [†]		1.0 [†]		1.0 [†]		1.0 [†]
35-49		0.63 (0.55-0.71)		0.90 (0.78-1.03)		0.58 (0.48-0.69)		0.95 (0.77-1.16)
50-64		0.41 (0.36-0.47)		0.73 (0.64-0.84)		0.45 (0.38-0.54)		0.84 (0.69-1.03)
65-79		0.31 (0.27-0.35)		0.57 (0.49-0.66)		0.37 (0.31-0.45)		0.58 (0.47-0.72)
80-84		0.31 (0.24-0.39)		0.45 (0.35-0.59)		0.33 (0.24-0.46)		0.45 (0.31-0.66)
Education	.343		.602		.029		.143	
High		1.0 [†]		1.0 [†]		1.0 [†]		1.0 [†]
Medium		0.95 (0.85-1.06)		1.06 (0.94-1.18)		0.90 (0.78-1.04)		0.86 (0.74-1.00)
Low		0.91 (0.80-1.03)		1.06 (0.93-1.20)		0.80 (0.68-0.94)		0.88 (0.74-1.05)
Country of Birth	<.0001		<.0001		<.0001		<.0001	
Born in Sweden		1.0 [†]		1.0 [†]		1.0 [†]		1.0 [†]
Foreign-born		1.37 (1.20-1.56)		1.47 (1.29-1.67)		1.51 (1.28-1.77)		1.93 (1.64-2.26)
Body Mass Index	.001		<.0001		<.0001		<.0001	
Normal		1.0 [†]		1.0 [†]		1.0 [†]		1.0 [†]
Overweight		1.00 (0.90-1.10)		1.18 (1.06-1.31)		1.28 (1.11-1.47)		1.67 (1.43-1.95)
Obese		1.24 (1.09-1.41)		1.32 (1.16-1.50)		2.31 (1.98-2.69)		2.81 (2.37-3.34)
Diabetes	<.0001		<.0001		<.0001		<.0001	
No		1.0 [†]		1.0 [†]		1.0 [†]		1.0 [†]
Yes		4.04 (3.53-4.63)		2.89 (2.51-3.32)		4.07 (3.49-4.76)		3.10 (2.62-3.67)
High Blood Pressure	<.0001		<.0001		<.0001		<.0001	
No		1.0 [†]		1.0 [†]		1.0 [†]		1.0 [†]
Yes		1.53 (1.37-1.71)		1.45 (1.30-1.62)		1.82 (1.59-2.09)		1.39 (1.38-1.86)

All odds ratios are multivariate, i.e. adjusted for other variables in the model, including sociodemographic factors (sex, age, education level, country of birth), health factors (BMI, chronic diseases). † Reference group.

Abbreviations: BMI calculated as weight divided by height squared, normal-weight (BMI 18.5-24.9 kg/m²), overweight (BMI 25-29.9 kg/m²), and obese (BMI equal to or over 30 kg/m²).

sociodemographic (gender, education and country of birth) and health factors (BMI, diabetes and high blood pressure). Despite known benefits of late-life exercise, older persons are less likely to receive counselling on exercise from clinicians than those in middle age [26]. Foreign-born persons received counselling more often than those born in Sweden, which may be due to the fact that risk factors such as a sedentary lifestyle are more common in the foreign-born than in the Swedish-born population [27].

Strengths of this study include the representativeness of the sample in a large population of five neighbouring areas.

The issue of providing health counselling is often studied with a focus on obese patients losing weight [14, 19-21]. In this study, we examined lifestyle counselling by health care professionals for adults who are normal-weight, overweight or obese.

Our approach has several limitations. Foremost, the studied characteristics of respondents were self-reported. The self-reported weights and heights used to classify persons into their BMI category may influence the validity of our study. People tend to report lower weight and greater height [28], which means that the true proportion of overweight and

Table 5. Factors Associated with Professionals' Counselling About Smoking and Alcohol-Drinking After Adjustment

	Asked				Advised			
	Smoking		Alcohol		Smoking		Alcohol	
Number of Observation	15 993		12 170		15 822		12 023	
	<i>p</i> -Value	OR (95% CI)	<i>p</i> -Value	OR (95% CI)	<i>p</i> -Value	OR (95% CI)	<i>p</i> -Value	OR (95% CI)
Sex	<.0001		<.0001		<.0001		<.0001	
Men		1.0 [†]		1.0 [†]		1.0 [†]		1.0 [†]
Women		0.75 (0.69-0.81)		0.49 (0.43-0.54)		0.68 (0.59-0.78)		0.28 (0.21-0.37)
Age	<.0001		<.0001		.007		.014	
18-34		1.0 [†]		1.0 [†]		1.0 [†]		1.0 [†]
35-49		0.70 (0.62-0.78)		0.72 (0.61-0.85)		1.08 (0.87-1.34)		0.84 (0.57-1.23)
50-64		0.53 (0.47-0.59)		0.57 (0.48-0.67)		1.11 (0.90-1.38)		0.87 (0.61-1.29)
65-79		0.32 (0.28-0.36)		0.34 (0.28-0.41)		0.84 (0.66-1.08)		0.58 (0.38-0.88)
80-84		0.19 (0.14-0.25)		0.19 (0.13-0.29)		0.45 (0.24-0.84)		0.24 (0.84-0.70)
Education	.445		.176		.001		.030	
High		1.0 [†]		1.0 [†]		1.0 [†]		1.0 [†]
Medium		1.00 (0.91-1.11)		0.98 (0.85-1.13)		0.88 (0.75-1.04)		0.74 (0.56-0.99)
Low		0.95 (0.85-1.06)		0.87 (0.74-1.02)		0.67 (0.54-0.82)		0.64 (0.45-0.91)
Country of birth	<.0001		<.0001		<.0001		<.0001	
Born in Sweden		1.0 [†]		1.0 [†]		1.0 [†]		1.0 [†]
Foreign-born		1.45 (1.29-1.62)		1.43 (1.22-1.67)		1.83 (1.52-2.20)		2.15 (1.58-2.93)
Body Mass Index	.227		.922		.239		.122	
Normal		1.0 [†]		1.0 [†]		1.0 [†]		1.0 [†]
Overweight		0.97 (0.89-1.05)		0.98 (0.86-1.11)		0.97 (0.82-1.13)		1.32 (0.99-1.77)
Obese		0.90 (0.80-1.01)		1.00 (0.85-1.18)		1.15 (0.94-1.41)		1.35 (0.95-1.94)
Diabetes	<.0001		<.0001		<.0001		<.0001	
No		1.0 [†]		1.0 [†]		1.0 [†]		1.0 [†]
Yes		1.48 (1.28-1.72)		1.80 (1.51-2.16)		1.81 (1.42-2.31)		2.34 (1.58-3.15)
High blood pressure	<.0001		<.0001		<.0001		.003	
No		1.0 [†]		1.0 [†]		1.0 [†]		1.0 [†]
Yes		1.44 (1.30-1.59)		1.53 (1.34-1.77)		1.62 (1.36-1.93)		1.57 (1.17-2.11)
Current smoker	<.0001		<.0001		<.0001		<.0001	
No		1.0 [†]		1.0 [†]		1.0 [†]		1.0 [†]
Yes		2.51 (2.30-2.74)		1.27 (1.11-1.45)		16.23 (13.81-19.07)		1.98 (1.51-2.60)
Risk Consumer of Alcohol	.177		.112		.290		<.0001	
No		1.0 [†]		1.0 [†]		1.0 [†]		1.0 [†]
Yes		1.11 (0.95-1.29)		1.30 (1.06-1.60)		1.34 (0.90-1.43)		5.56 (4.06-7.62)

All odds ratios are multivariate, i.e. adjusted for other variables in the model, including sociodemographic factors (sex, age, education, country of birth), health factors (BMI, chronic diseases) and lifestyle factors (smoking habits, alcohol habits). † Reference group. Abbreviations: BMI calculated as weight divided by height squared, normal-weight (BMI 18.5-24.9 kg/m²), overweight (BMI 25-29.9 kg/m²), and obese (BMI equal to or over 30 kg/m²).

obese persons is likely higher in this study. Underestimation of BMI tends to be higher for women, the obese, and the elderly. On the other hand, the proportional decrease of BMI

at age 80 or over in both gender groups in this study confirms the generally accepted pattern of weight loss in old age [29].

There are potential sources of response biases, including recall bias, as these persons were asked to remember their latest visit to a health care provider. First, some respondents may not have remembered discussions with a health care professional about lifestyle. This bias would underestimate actual counselling rates. Huang *et al.* [20] found that 79 percent of the patients recalled being counselled by the physician to lose weight in an interview immediately after a clinic visit. Second, in persons who had multiple visits in the previous three months or earlier, we did not capture data about counselling that occurred at an earlier visit.

The overall response rate of the present study was 64 percent. The response rate differed between women and men as well as between different age groups. Moreover, the response rate varied between the Nordic and non-Nordic born group. It is, however, unlikely that the association between gender and counselling on lifestyle by health care professionals differ between the respondents and non-respondents to such an extent that it could crucially affect the results obtained in this study. The findings show that response rates are lower for the non-Nordic group. These lower response might lead to non-response bias if this group have different perception of health care professionals' lifestyle counselling.

The results of the study show that the majority of persons with risk factors who visited a health care provider did not receive lifestyle counselling. Counselling to promote a healthy lifestyle may have a substantial public health impact, for that reason there is a need for continued implementation of lifestyle promoting counselling strategies in health care settings [12, 30]. In addition, there is evidence for cost-effectiveness [16-18] of interventions to promote a healthy lifestyle. Patients who are advised by health professionals to change lifestyles are more likely to attempt to change their behaviours than those who are not advised [19]. However, important barriers [20, 21] to counselling, (e.g. limited time, lack of skills in providing brief counselling, low confidence in their ability to counsel, insufficient knowledge of best clinical practice, and lack of documentation), need to be removed. Behavioural change strategies with the 5As model (Ask, Assess, Advise, Assist, Arrange), adapted from an evidence-based approach originally developed for smoking cessation, have been broadly applied to several other health behaviours [15]. This model involves asking patients about their current lifestyle status, assessing the level of risk factor and its relevance to the individual in terms of health, readiness to change/motivation, advising them to change lifestyle habits, offering assistance by way of support for self monitoring, e.g. physical activity on prescription (Swedish: *FaR* – physical activity prescription [31]), and arranging follow-up contact. The lifestyle status, advice given and the patient's response should be recorded in the patient's records [21] for supporting further monitoring, service planning and health services research.

CONCLUSION

The findings indicate that the majority of persons with known risk factors who visited a health care provider did not receive lifestyle counselling. Smoking and physical activity are the most common themes for asking and advising by

health care professionals. Persons with obvious needs of counselling, e.g. with diabetes, obesity and high blood pressure, were more likely to receive counselling. The probability to be counselled on lifestyle habits decreases with age. Compared with men, women are less often received counselling on diet, physical activity, smoking, and drinking.

ACKNOWLEDGEMENTS

The County Councils of Uppsala, Sörmland, Västmanland, Värmland, and Örebro funded this study. The authors would like to thank Lennart Bodin, professor of Statistics at the Statistical and Epidemiological Unit, Örebro University Hospital, for his valuable advice on the statistical analyses and comments on the manuscript.

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Received: August 28, 2009

Revised: December 11, 2009

Accepted: December 31, 2009

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