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The lack of social gradient of health behaviors and psychosocial factors in Northern Italy

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Summary

Objectives: To examine inequalities in health behaviors and psychosocial factors in Northern Italy.
Methods: The study was based on a computer-assisted telephone interview (CATI) of 4 002 non-institutionalized adults living in the Veneto region of Italy.
Results: Cigarette smoking, binge drinking, fruit and vegetables consumption and stress failed to show a social gradient. Only physical activity was significantly associated with social class. Stress was a significant predictor of physical inactivity, smoking and low fruit and vegetable intake. Lack of emotional support was associated with smoking and physical inactivity among males, and low fruit and vegetable intake for both genders.
Conclusions: Three proposed explanations may account for the lack of consistent social gradient of health behaviors in Northern Italy: a) socio-economic context; b) uncompleted epidemiological transition of behavioral risk factors across social classes; c) lack of systematic health promotion efforts. Future research is needed to examine the plausibility of such explanations.

Keywords: **Social class – Health behaviors – Psychosocial factors – Italy – Socio-economic status.**

The socio-economic gradient of health behaviors has been repeatedly observed across an array of behavioral practices. Lower socio-economic groups are more likely to smoke (Evandrou & Falkingham 2002), consume alcohol (Dee 2001), binge drink (Lee & Crombie 1990), have poorer dietary habits (Griffith 2001), be obese or overweight (Winkleby & Fortmann 1990) and engage in lower levels of physical activity (Wardle & Griffith 2001). However, causal pathways linking socio-economic factors and health-related behaviors are poorly understood.

Advances in the field of health inequalities have proposed psychosocial factors as potential mediators of the relationship between social class and health behaviors. Lynch and colleagues (1997), using different indicators of the socio-economic life course, demonstrated that poor health behaviors and psychosocial characteristics cluster in lower socio-economic groups. Other studies showed that higher levels of psychological stress are associated with major health behaviors such as smoking (Metcalfe & Smith 2003), alcohol consumption (Tyssen & Vaglum 2001), low fruit and vegetable intake (Steptoe & Perkins-Porras 2003), lack of weight control (Jeffrey & Simone 1996) and physical inactivity (Bradstock & Forman 1988). Similarly, social isolation was found to be a predictor of unhealthy behaviors. Social relations, either acting as a stress-buffering mechanism or having a more direct effect, reduce the likelihood of adopting risky behaviors such as smoking and alcohol drinking (Steptoe & Wardle 1996) as well as overeating (Cohen & Underwood 2000).

This evidence on the relationships between socio-economic factors, psychosocial factors and health behaviors is mostly from the USA and Northern European countries. There is a paucity of data on the socio-economic gradient of health behaviors from Southern European countries, and we are not aware of any study evaluating the contribution of psychosocial factors in explaining these relationships. Moreover, the social pattern of health behaviors in Southern Europe seems to be different than that found in the USA and Northern Europe. A recent investigation from France found that education was negatively associated with leisure-time physical

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activity among 50–59 years old men (Wagner et al. 2003). Research conducted in Spain found that women in the upper social classes were more likely to smoke than those in the lower social classes, while among males, social class was not statistically significantly associated with smoking. No differences were found in terms of excessive alcohol consumption across social classes among males, while this risky behavior was more prevalent among women of higher social classes (Borrell & Dominiguez-Berjon 2000). A study from Italy corroborated findings from Spain showing that for females higher education was associated with a higher prevalence of smoking. When considering occupation, female farmers were about three times less likely to smoke compared to higher occupational classes such as office workers and professionals (Vescio & Davey-Smith 2001).

The aim of the present research is to examine the social gradient of four major health-damaging behaviors (smoking, binge drinking, low fruit and vegetable intake and physical inactivity) in Northern Italy. We are also interested in assessing whether or not psychosocial factors such as stress and lack of social support cluster in low social classes and individuals adopting poor health behaviors.

Methods

Data are from the Health Determinants Surveillance System (HDSS) Survey 2003, a cross-sectional telephone survey of the civilian, non-institutionalized, adults living in the Veneto region (Italy). Interviews lasted about 20 minutes and were conducted in Italian. The HDSS questionnaire was adapted from previous health interview surveys (De Vogli & Gnesotto 2004).

The sampling strategy involved a two-stage design. In the first stage, a random digit dialing (RDD) was used to select households in Veneto. The entire sample of working telephone numbers was stratified, using the seven provinces of Veneto (Belluno, Padova, Rovigo, Treviso, Venezia, Verona, and Vicenza) as strata. Two low-density populated provinces (Belluno and Rovigo) were over-sampled using a higher sampling fraction (1.75:1) to limit sampling error of estimates to plus or minus 0.08 (95% CI). In the second phase, a quota sampling strategy was used to select respondents within the household with age, sex, educational attainment, employment status, and place of birth as quota controls.

Data were collected on a sample of 4002 subjects. A response rate of 57% was achieved[1]. Unfortunately, there is a limited amount of information on refusals. The interview was anonymous, and it was not possible to keep track of demographic characteristics of refusals. Moreover, the Italian Personal Data Protection Act prevents the identification and reporting of socio-demographic information on refusals through linkages to phone numbers and census data. To partially cover this information gap, interviewers and interview supervisors were asked to deliver written reports with regard to the interview and refusals characteristics. According to these reports, and correspondence with interviewer supervisors, most refusals dropped out at the very beginning of the interview. Very few of those who started being interviewed did not complete the interview. Records of interviewers showed that most refusals were predominantly males of younger age. This is consistent with findings in the literature that report higher refusal rates among young males aged 18–35. Unfortunately, no information is available regarding how refusals were distributed in terms of socio-economic status.

Health behaviors

Cigarette smoking, alcohol consumption, fruit and vegetable intake and physical activity were selected as health outcomes of this study. According to the World Health Organization (WHO), these behavioral practices account for about 48.9% of all deaths and 38.7% of disability adjusted life years (DALYs) among males and 23.1% of all deaths and 16.1% of DALYs among females living in developed nations (WHO 2002). Questions to measure these behaviors were translated and adapted from the Behavioral Risk Factors Surveillance System (BRFSS) conducted in 2003 (CDC 2003).

Cigarette smoking: Tobacco smoking was measured by three questions to distinguish between those who are currently smokers, ex-smokers and those that never smoked. A first question asked respondents to state if during their entire life they smoked at least 100 cigarettes. They were also asked to state if, at the time of the survey, they smoked cigarettes every day, some days, or not at all.

Alcohol consumption: Alcohol consumption was determined by first asking whether the respondent had drunk any alcohol in the past 30 days. If the respondent answered that he or she had used alcohol in the past month, the interviewer asked for the average number of drinks per day. A drink was defined as one beer, one glass of wine or one mixed drink. Moderate drinking was defined as taking an average of one or less drinks per day. Chronic drinking was defined as taking an average of two or more drinks per day. Binge drinking was determined by asking if the respondent had consumed five or more drinks on one occasion during the past month.

[1] In comparison with the general population of Veneto in 2001, a slightly lower proportion of adults aged 65 or more (16.4% vs. 18.0%) and a slightly higher proportion of people with less than high school diploma (76.1 % vs. 72.1 %) responded.

Fruit and vegetable intake: Dietary intake of fruit and vegetable was assessed by asking respondents to report the number of servings of fruit and vegetables per day they had in the past month. A serving of fruit and vegetables was defined as the equivalent of an apple, a portion of cauliflower, a portion of green salad, or a glass of orange juice.
Physical activity: Respondents were asked if during the past 30 days, other than during their regular job, they participated in any vigorous physical activity such as running or moderate physical activity such as walking.

Psychosocial factors
Stress: Stress in the HDSS Survey was measured using a brief version of the Perceived Stress Scale (Cohen & Williamson 1988) composed by four items: 1) "In the last month, how often have you felt confident about your ability to handle your personal problems?"; 2) "In the last month, how often have you felt that things were going your way?"; 3) "In the last month, how often have you felt that you were unable to control the important things in your life?"; 4) "In the last month, how often have you felt as difficulties were piling up so that could not be overcome?". Alternatives were the following: never (0), almost never (1), sometimes (2), fairly often (3) and very often (4). An overall measure of stress was obtained by reversing the scores of the two positively stated items with high score indicating a higher level of stress (range 0–16).
Social support: Social support was assessed through single items on emotional support "Can you count on anyone to provide you with emotional support (talking over problems and helping you to make a difficult decision)?" and instrumental support "When you need some extra help, can you count on anyone to help you with daily tasks like grocery shopping, house cleaning, cooking, telephoning, giving you a ride?". The response for the first item is dichotomous (yes or no); the second item is followed by 11 potential sources that could provide support, and count is made of the affirmative response (Seeman & Berkman 1988). Sources of support were: spouse, daughters, sons, siblings, other relatives, neighbors, co-workers, church members, club members, professionals, and other friends.

Social class
Social class was obtained from an Italian adaptation of the 2001 British's Office for National Statistics classification system, called the National Statistics Socio Economic Classification (NS-SEC). The NS-SEC classifies people's occupations on the basis of employment relations and conditions, and it is now widely adopted in both the UK and other European countries (Rose & Pevalin 2001). The seven-category NS-SEC includes the following social classes: higher managers and professionals (e.g. sales managers of large organizations, lawyers, higher education teaching professionals), lower managerial and professionals (e.g. marketing managers of small organizations, public services associate professionals), intermediate occupations (e.g. accounts and wage clerks, database assistants), small employers (e.g. shopkeepers and whole-sail retailers, self-employed electricians), lower supervisors, craft and related occupations (e. g. supervisors in foundries, printers), semi-routine occupations (e.g. care assistants, glass process operatives), and routine occupations (e.g. sewing machinists, cleaners). People who were unemployed, unable to work, in civil service, students, housekeepers not in the workforce and those providing inadequate descriptions (n = 675) were excluded from the analysis.

Demographics and other socio-economic factors
Demographic measures included respondents' gender, age, place of birth, and marital status. Information regarding the area of residence of respondents was automatically provided by the CATI system. Moreover, information was gathered regarding educational attainment, car ownership, residential density, and housing tenure.

Data analysis
All health behaviors used in this study were dichotomized. Behaviors considered to be unhealthy were regular smoking, binge drinking, having two or less servings of fruit and vegetable intake per day, and not engaging in any physical activity. The cut off-point for fruit and vegetable intake was set by statistical criteria. It is possible that another cut-off point would have produced different results. Ideally, a consumption of at least five servings of fruit and vegetables per day recommended by the United States Food and Drug Administration (USFDA) should have been used as a cut-off point. However, such indicator was not used because a very small percentage of people in the sample consumed at least five servings of fruits and vegetables per day.
Data analyses were performed using SPSS 11.0 (SPSS 2003). First, we analyzed the distributions of health behaviors and psychosocial factors by age and gender. Then, we used chi-square tests for independence to examine the social gradients of health behaviors, stress, and social support. Finally, we calculated age-adjusted odds ratios between behavioral practices and psychosocial stress by gender using logistic regression.
Data were adjusted for geographic substrata per province to compensate for the over sampling of Belluno and Rovigo provinces and for the number of adults per household (Holt

& Smith 1979). Details regarding the development of the final weighting formula are reported elsewhere (De Vogli & Gnesotto 2004).

Results

A total sample of 4002 people was used to examine the distribution of major variables of interest. However, analyses on the social gradient of health behaviors and psychosocial factors were restricted to 3327 respondents. When considering demographic factors, females slightly outnumbered males. Respondents ranged in age from 18 to 91 years old with an average age of 45.7 (SD = 16.8). Marital status differed between males and females, with more females being widowed or separated. Males were more likely to be single. Socio-economic characteristics also varied by gender with females generally reporting lower socio-economic status than males in terms of educational attainment, housing tenure, car ownership and residential density (data not shown).

Prevalence of health behaviors

Overall, the prevalence of health behaviors tended to vary by gender and age (Tab. 1). Adult men of all ages were more likely to smoke compared to women, and differences in smoking status between sexes existed for all the adult age groups. The probability of being a current smoker was higher for men aged 18–34 years old compared to those who were older. Among women, the aged 35–44 reported the highest proportion of smokers. Binge drinking was greater among males in all age groups, and was lowest in the oldest group who reported the highest percentage of chronic drinking. In general, women had healthier dietary patterns than men. However, for both genders, older subjects tended to eat more servings of fruit and vegetable. Finally, men were more likely to engage in vigorous physical activity than females and older respondents were less likely to be physically active during their leisure time compared to younger individuals.

Prevalence of stress and social support

Table 2 describes the prevalence of psychological stress and social support by gender and age. Females reported higher stress than males. For females, age was positively related to the likelihood of being distressed. Women aged 65 or older reported higher levels of stress than other age groups. Among males, younger individuals tended to report higher levels of stress.

For both genders age was inversely associated with availability of both instrumental and emotional support. The proportion of males and females aged 65 and above who had no one to count on help with daily activities such as grocery shopping, housework was much higher compared to younger individuals. Similarly, the proportion of males and females aged 65 and above who had no one to count for talking about a personal problem or discuss a difficult life decision was higher than in other age groups.

Table 1 Prevalence of smoking, alcohol consumption, fruit and vegetables consumption and physical activity by age and gender (Italy, 2003)

	Males (n = 1904) [%]				Females (n = 2098) [%]			
	18–34	35–44	45–64	65+	18–34	35–44	45–64	65+
N	624	327	686	266	647	336	723	392
Smoking								
smokers	36.7	28.9	25.9	13.5	24.6	25.9	19.8	9.8
ex-smokers	14.7	30.5	43.3	48.3	10.4	13.2	16.6	14.0
never-smoked	48.6	40.6	30.8	38.2	65.0	60.9	63.6	75.9
Alcohol consumption								
binge drinkers	22.3	12.9	10.7	8.4	6.3	4.0	3.4	3.5
chronic drinkers	8.4	22.0	37.3	42.8	2.6	5.3	11.8	11.4
moderate drinkers	53.2	48.6	34.4	28.8	44.4	36.1	41.2	32.5
abstainers	16.2	16.5	17.5	20.0	46.7	54.7	43.6	52.7
Physical activity								
none	30.4	43.1	37.1	43.1	36.7	36.5	35.6	46.7
moderate	39.0	41.5	52.4	52.0	46.4	47.4	56.1	48.6
vigorous	30.5	15.5	11.6	5.9	17.6	16.2	8.5	4.7
Fruit & vegetable intake								
0 servings/day	28.2	20.6	9.6	9.1	18.1	8.7	5.7	6.9
1–2 servings/day	47.4	48.4	43.5	42.2	48.8	51.5	42.2	35.6
3–4 servings/day	20.7	23.7	37.8	41.1	29.0	34.6	40.1	45.4
5+ servings/day	3.7	7.3	9.2	7.6	4.1	5.2	12.0	12.1

Table 2 Prevalence of stress and social support (emotional and instrumental) by age and gender (Italy, 2003)

	Males (n = 1904) [%] or Mean (+SD)				Females (n = 2098) [%] or Mean)+SD)			
	18–34	35–44	45–64	65+	18–34	35–44	45–64	65+
N	624	327	686	266	647	336	723	392
Stress								
often/very often unable to control important things in life	9.8	5.9	5.1	6.2	10.9	12.9	11.6	12.1
never/almost never confident in handling personal problems	4.4	4.5	3.4	4.4	6.3	4.4	6.5	8.5
never/almost never felt that things going my way	7.4	6.8	6.8	5.8	10.5	9.5	11.0	14.7
often/very often felt as difficulties were piling up could not be overcome	6.0	5.5	4.2	4.6	8.3	9.3	8.3	10.1
overall measure of perceived stress	4.2 (2.9)	3.7 (2.7)	3.4 (2.7)	3.5 (2.9)	4.6 (2.9)	4.6 (2.9)	4.8 (3.1)	4.9 (3.4)
Social support								
none to count for instrumental support	1.2	3.4	4.8	5.9	3.1	5.1	5.4	5.5
average number of persons to count for instrumental support	6.7 (5.6)	5.2 (5.4)	4.7 (5.3)	3.6 (5.2)	4.5 (3.5)	3.8 (4.1)	3.1 (3.5)	2.9 (2.9)
none to count for emotional support	7.0	8.2	10.1	12.2	3.9	10.2	7.6	11.1
average number of persons to count for emotional support	3.6 (3.4)	2.4 (2.5)	2.5 (2.5)	2.4 (2.6)	3.1 (5.8)	2.5 (2.0)	2.6 (2.1)	2.3 (2.1)

Social class and health behaviors

As shown in Table 3, the relationship between social class and health behaviors was not consistent across all behavioral practices. Only physical activity was statistically significantly associated with social class for both males ($\chi^2 = 59.716$; $p < 0.001$; DF = 6) and females ($\chi^2 = 17.836$; $p < 0.01$; DF = 6). Smoking[2], binge drinking and fruit and vegetable intake failed to show a social gradient. However, the relationship between social class and physical inactivity was not linear across the seven NS-SEC categories. Although managers and professionals were the least likely to be physically inactive for males (20.7%) and females (31%), a non-linear social pattern of behaviors was found for both genders. Among males, a higher proportion of small employers did not engage in any leisure-time physical activity in the last month compared to lower supervisors, routine and semi-routine occupations (51.4% vs. 34.1%, 36.9% and 44.9% respectively). Among females, lower supervisors were more likely to be inactive compared to routine and semi-routine occupations (46.1% vs. 43% and 41.5% respectively).

Social class, stress and social isolation

Table 3 shows that social class was not significantly associated with psychological stress. When considering social support, social class was found to be associated with emotional support for both males ($\chi^2 = 15.268$; $p < 0.05$; DF = 6) and females ($\chi^2 = 12.521$; $p < 0.05$; DF = 6). However, the inverse gradient was not linear across different social classes. Small employers were the most emotionally isolated individuals among the seven NS-SEC classes among males (13.4% vs. 10.6% or less) and females (11.7% vs. 9.5% or less). No association between social class and instrumental support was found.

Psychosocial factors and health behaviors

Table 4 shows that higher psychological stress and lack of emotional support were significant predictors of selected health-impairing behaviors, except binge drinking. Among males, the relationship between stress items and health behaviors was consistent across smoking (OR = 1.75; 95% CI = 1.07–2.84), low fruit and vegetable intake (OR = 1.51; 95% CI =1.04–2.18) and physical inactivity (OR = 2.09; 95% CI= 1.31–3.31). Lack of emotional support was significantly associated with smoking (OR = 1.65; 95% CI = 1.16–2.30), low fruit and vegetable intake (OR = 1.75; 95% CI = 1.27–2.43) and physical inactivity (OR = 1.76; 95% CI = 1.28–2.42). No association was found between lack of instrumental support and health behaviors.

Among females, psychological stress was more strongly and consistently related to health behaviors compared to males. Among female respondents reporting higher levels of psychological stress, the odds of smoking, low fruit and

[2] Although the association between social class and smoking was not statistically significant, Table 3 shows that there was a general increase of smoking behavior for males as they moved from higher to lower social classes.

Table 3 Social class variation in health behaviors and psychosocial factors by gender in % (Italy, 2003)

		NS-SEC Social Classes (N = 3327)							Sig. (DF)
		1	2	3	4	5	6	7	
N	Male	186	278	101	352	351	177	290	
	Female	45	266	205	206	116	333	421	
Health Behaviors									
smoking	Male	20.7	20.6	27.6	27.4	26.8	29.1	30.6	–
	Female	14.3	17.3	22.2	21.5	23.7	18.1	17.8	–
binge drinking	Male	9.4	14.5	12.2	14.1	15.2	13.5	15.1	–
	Female	11.9	4.0	4.8	5.1	7.9	2.1	4.8	–
low fruit/veg. Intake	Male	43.3	44.9	45.4	45.0	40.5	51.4	47.4	–
	Female	28.6	34.8	40.1	29.6	30.3	29.8	33.8	–
no physical activity	Male	20.7	30.3	32.0	51.4	34.1	36.9	44.9	0.001 (6)
	Female	31.0	31.1	31.2	40.8	46.1	43.0	41.5	0.01 (6)
Stress									
never/almost never confident handling personal problems	Male	2.0	1.8	5.1	3,8	3,5	4,0	4.8	–
	Female	7.1	4.4	8.6	4.1	5.3	6.0	7.1	–
never/almost never felt that things going my way	Male	6.1	6.1	6.1	8.1	4.4	7.9	6.4	–
	Female	4.7	8.0	11.8	9.2	6.6	10.4	12.4	–
very often/often unable to control important things life	Male	4.8	3.9	9.2	6.3	6.9	6.9	8.6	–
	Female	9.5	11.9	8.6	10.3	10.5	10.7	10.3	–
very often/often felt as difficulties were bring up so that could not be overcome	Male	3.4	4.3	5.1	3.7	5.4	5.1	6.3	–
	Female	4.8	9.9	4.3	6.2	7.9	8.9	10.2	–
Social support									
none to count for instrumental support	Male	3.3	3.4	0.0	6.0	2.9	3.4	3.7	–
	Female	4.7	3.1	6.3	6.2	3.9	5.9	5.7	–
none to count for emotional support	Male	6.0	8.2	3.1	13.4	7.3	10.6	9.9	0.05 (6)
	Female	4.7	6.3	4.7	11.7	9.2	9.5	5.7	0.05 (6)

Notes: NS-SEC Occupational Classes were the following: 1. Higher managers and professionals; 2. Lower Managers and professionals; 3. Intermediate occupations; 4. Small employers; 5. Lower supervisors; 6. Semi-routine occupations; 7. Routine occupations.

Table 4 Age-adjusted odds ratios between unhealthy behaviors and psychosocial factors by gender (N = 3 327) (Italy, 2003)

Psychosocial factors	Cigarette smoking		Binge drinking		Low fruit & veg. intake		No physical activity	
	Males OR (95% CI)	Females OR (95% CI)	Males OR (95% CI)	Females OR (95% CI)	Males OR (95% CI)	Females OR (95% CI)	Males OR (95% CI)	Females OR (95% CI)
Stress								
never/almost never confident handling problems	1.75[1] (1.07–2.84)	1.45 (0.96–2.21)	0.77 (0.37–1.57)	1.56 (0.75–3.24)	1.35 (0.84–2.16)	1.33 (0.92–1.92)	2.09[3] (1.31–3.31)	2.10[3] (1.48–3.00)
never/almost never felt that things going my way	1.36 (0.92–2.01)	1.36 (0.98–1.90)	1.46 (0.92–2.31)	1.59 (0.98–2.84)	1.51[1] (1.04–2.18)	1.44[2] (1.08–1.92)	1.41 (0.98–2.03)	1.69[3] (1.28–2.22)
very often/often unable to control important things life	1.32 (0.90–1.94)	1.53[2] (1.11–2.11)	0.82 (0.48–1.37)	1.69 (0.97–2.95)	1.41 (0.97–2.04)	1.59[3] (1.20–2.11)	1.81[3] (1.26–2.59)	2.00[3] (1.52–2.62)
very often/often felt difficulties no overcome	1.31 (0.84–2.04)	1.96[3] (1.39–2.77)	0.64 (0.33–1.25)	1.46 (0.76–2.80)	1.34 (0.88–2.06)	1.77[3] (1.29–2.43)	1.32 (0.87–2.01)	2.33[3] (1.71–3.17)
Social support								
none to count for instrumental support	1.17 (0.66–2.07)	0.91 (0.52–1.58)	1.46 (0.74–2.90)	0.64 (0.18–2.26)	1.21 (0.73–2.01)	1.51 (0.99–2.32)	1.15 (0.70–1.89)	1.32 (0.88–1.99)
none to count for emotional support	1.65[2] (1.16–2.30)	1.48 (0.98–2.24)	1.07 (0.68–1.69)	0.56 (0.18–1.73)	1.75[3] (1.27–2.43)	1.38 (0.96–1.98)	1.76[3] (1.28–2.42)	1.57[2] (1.12–2.20)

Note: CI = Confidence Interval.
Data were weighted to adjust for the number of adults within each household, and over sampling of adults living in Belluno and Rovigo provinces.
[a] Adjusted for age.
Statistically significant difference: [1] $p < 0.05$.; [2] $p < 0.01$; [3] $p < 0.001$.

vegetable intake, and physical inactivity were between 1.53 times (95% CI = 1.11–2.11) and 2.33 times (95% CI = 1.71–3.17) higher than those reporting lower levels of psychological distress. Lack of emotional support was significantly associated only to physical inactivity (OR = 1.57; 95% CI = 1.12–2.20). No association was found between emotional isolation, and smoking and low fruit and vegetable intake. Similarly, lack of instrumental support was not associated with any health behaviors.

Discussion

Our data from the Veneto region of Italy corroborates only some of the findings in the literature on the association between health behaviors and socio-economic factors. Consistent with results from other research projects, this study shows that those in the higher social classes are more likely to engage in leisure-time physical activity (Wardle & Griffith 2001). Also, as shown in previous investigations, this research demonstrates that psychosocial factors are important predictors of smoking, dietary intake and physical inactivity (Lynch et al. 1997). Instrumental support failed to show a statistically significant association with both social class and health behaviors, however, the small number of individuals with no instrumental support in the sample may account for the lack of statistical significance.

In contrast to earlier studies which showed that those in the lower social classes tend to have poorer health behaviors (Lantz et al. 1998), and psychosocial characteristics (Allgower et al. 2001), our data on health behaviors and psychological stress do not show a consistent social gradient. Unexpectedly, we found no association between social class and cigarette smoking, binge drinking and fruit and vegetable intake. Moreover, our study shows that among males, small employers were more likely to be physically inactive than those in the lower social classes. Among females, lower level supervisors were more likely to be physically inactive than routine and semi-routine occupations. Small employers were also more socially isolated than routine and semi-routine occupations for both genders.

Discrepancies between our study findings and those reported in the USA, Canada and Northern Europe, where steep social gradients of risky behaviors have been repeatedly observed may indicate that the relationship between social class and health behaviors is not universal, but instead depends on specific characteristics to place.

The lack of association we found between socio-economic factors, health behaviors and psychosocial characteristics is surprising and may be explained by different factors not necessarily mutually exclusive. First, the socio-economic context of the study site may matter. The Veneto region is marked by a low level of income inequality (De Vogli et al. 2005), a small proportion of people living below the poverty line, a low unemployment rate (Bank of Italy 2003), and a strong social safety net. It is possible that this distinct set of social and economic characteristics acts to reduce the effect of income inequality on health behaviors and protect the lower social classes from the stress provoked from being low in the socio-economic ladder. For example in Italy, fruits and vegetables are widely available to the whole population and thus, consumption may be less influenced by socio-economic factors compared to the US and Northern European countries where such foods are more difficult to obtain (Mitchell 2004).

Second, study findings can also be explained in terms of uncompleted epidemiological transition of health behaviors across social classes in Northern Italy. Such transition occurred in the US and UK, where there has been a reversal in the social gradient of health-damaging behaviors: no longer primarily risk factors of higher social classes, behaviors such as smoking, alcohol drinking, and sedentary lifestyle became more common among the less well-off (Wilkinson 1994). It is possible that Northern Italy, similarly to other Latin European countries, is in an intermediate phase of such epidemiological transition and higher social classes have just began to adopt healthier behaviors compared to lower social classes. This hypothesis may find some support from the analysis of smoking prevalence among Italian physicians that remains similar to that of the general population (La Vecchia et al. 2000), compared to the much lower prevalence rates among doctors in the US and UK, that have dramatically changed their behavior in the last few decades (Nelson & Giovino 1994; Peto et al. 2000).

Third, the difference in terms of social gradient of health behaviors between Italy and Northern European countries and the US may also be due to the success of interventions aimed at increasing healthy behaviors in the latter nations (John & Yudkin 2003; Birmingham & Shultz 2004), as compared to the lack of such systematic health promotion efforts in Italy. Although there is evidence that successful interventions in the US and Northern Europe have reduced poor behavioral practices, such strategies have inadvertently exacerbated inequalities in health behaviors because higher social classes responded much more to health promotion programs than did more economically disadvantaged groups (Lawlor et al. 2003). In Italy where health promotion programs have been severely under funded, poorly implemented, and seldom evaluated there has been less opportunity for them to have had the unintended consequence of heightening social disparities.

This research has some significant limitations. Cross-sectional data, collected at a single point in time can only be used to indicate associations and cannot test cause-effect relationships. The directionality of the relationships between psychosocial factors and health lifestyle can be questioned. Although we have assumed that stress has an effect on health behavior, in fact the reverse may be true. Another limitation is the use of a non-probability sample in the HDSS Survey. The use of quota sampling makes it difficult to generalize findings to the general population even though a comparison of demographic characteristics of the HDSS sample with the 2001 Census showed that selection biases were very small. Finally, non-coverage errors may be a concern. Persons living in non-residential settings, such as hospitals, nursing homes, prisons, and military bases were excluded from the survey. Moreover, non-coverage errors may also have occurred because in telephone survey information about the upper and lower tails of the socio-economic continuum may be missing.

Despite such limitations, the results of this research are important because they indicate that the effect of socio-economic factors on psychological stress and health behavior needs to be understood by taking into account contextual factors of study site. Further research is needed to examine which of the proposed factors explain the lack of social gradient of health behaviors in Italy and Southern European countries.

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Zusammenfassung

Das Fehlen eines Sozialgradienten bei Gesundheitsverhalten und psychosozialen Faktoren in Norditalien

Fragestellung: Untersuchen der Ungleichheiten von Gesundheitsverhalten und psychosozialen Faktoren in Norditalien.

Methoden: Die Studie basierte auf 4002 computerassistierten Telefoninterviews (CATI) mit Erwachsenen, die nicht in Institutionen leben, in der Veneto-Region in Italien.

Ergebnisse: Für Zigarettenrauchen, exzessiven Alkoholkonsum, Frucht- und Gemüseverzehr und Stress liess sich kein Sozialgradient erkennen. Einzig bei physischer Aktivität zeigte sich ein signifikanter Zusammenhang mit sozialer Klasse. Stress war hingegen ein signifikanter Prädiktor für körperliche Inaktivität, Rauchen und kleinen Frucht- und Gemüseverzehr. Mangel an emotionaler Unterstützung stand in Zusammenhang mit Rauchen und körperlicher Inaktivität bei Männern und geringer Frucht- und Gemüseeinnahme bei beiden Geschlechtern.

Schlussfolgerungen: Drei konkurrierende Erklärungen können das Fehlen eines Sozialgradienten bei Gesundheitsverhalten in Norditalien begründen: a) der sozioökonomische Kontext; b) unvollständige epidemiologische Durchdringung von Verhaltensrisikofaktoren aller sozialer Klassen; c) Mangel an systematischen Bestrebungen in der Gesundheitsförderung. Weitere Forschung ist erforderlich, um die Plausibilität solcher Erklärungen zu untersuchen.

Résumé

Manque de gradient social pour les comportements en matière de santé et les facteurs psychosociaux en Italie du Nord

Objectifs: Examiner les inégalités face aux comportements de santé et aux facteurs psychosociaux en Italie du Nord.

Méthodes: L'étude a interrogé par téléphone (Computer Assistsed Telephone Interview (CATI)) 4002 adultes non institutionnalisés et vivant dans la région italienne de la Vénétie.

Résultats: Le tabagisme, l'alcoolisation excessive, la consommation de fruits et légumes ainsi que le stress n'ont pas montré de gradient social. Seule l'activité physique était significativement associée avec la classe sociale. Le stress était un prédicteur significatif de l'inactivité physique, du tabagisme et d'une consommation limitée de fruits et de légumes. Le manque de support émotionnel était associé avec le tabagisme et avec l'inactivité physique chez les hommes, ainsi qu'avec une consommation limitée de fruits et de légumes chez les deux sexes.

Conclusions: Trois explications complémentaires pourraient expliquer cette absence de gradient social des comportements de santé en Italie du Nord: a) le contexte socio-économique, b) le fait que la transition épidémiologique des facteurs de risques comportementaux ne soit pas encore achevée à travers toutes les classes sociales, c) un manque d'efforts systématiques en promotion de la santé. Des recherches supplémentaires sont nécessaires pour corroborer ou non ces potentielles explications.

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