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Socioeconomic inequalities in current daily smoking in five Turkish regions

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Abstract

Objectives   To assess whether socioeconomic inequalities in smoking in five regions across in Turkey have the same pattern as observed in southern Europe.

Methods   Cross-sectional data of the World Health Survey 2002 from Turkey were analyzed (5,951 women and 4,456 men) to evaluate the association of smoking with wealth and education. Age-standardized prevalence rates and odds ratios were calculated separately by sex, region and age groups.

Results   Smoking prevalence was 16.7 % for women and 51.4 % for men. Smoking risk was increased in higher wealth and education groups among women in all regions and for both younger and older generations. In the East, Middle and Black Sea regions this female pattern was most pronounced. For men, smoking was less prevalent in the two highest wealth groups. Unlike among women, socioeconomic differences in smoking were approximately equally large in all regions.

Conclusions   Patterns of inequalities in smoking across the five regions strongly resemble those observed in southern Europe. This fits the patterns predicted by the smoking epidemic model. Particular attention should be given to highly educated women, who may perceive smoking as a symbol of modernity, emancipation and independence.

Introduction

Several studies have shown that, within Europe, the patterns of socioeconomic inequalities in smoking vary greatly between countries (Huisman et al. 2005a; Leinsalu et al. 2007; Schaap et al. 2008). Especially, marked was a contrast between northern and southern European countries with regards to smoking inequalities among women. Whereas among women in the North smoking was more common among lower socioeconomic groups, in southern European countries it was more common among higher socioeconomic groups (Cavelaars et al. 2000; Huisman et al. 2005a, b; Giskes et al. 2005). Among southern women, smoking was especially related to high education, while it was less closely related to occupational class or wealth. Furthermore, the pattern of reverse inequalities was found most clearly in the least developed countries (Portugal, Greece) and regions (e.g., the southern part of Italy) (Cavelaars et al. 2000; Huisman et al. 2005a, b).

Lopez has developed the four-staged "smoking epidemic model" to define the diffusion of smoking. In the first stage, the smoking prevalence is low for both sexes. In the following stage for men the prevalence rises from 50 to 80 %. The peak reached at the third stage is followed by a decrease. The women go through a similar pattern about 20 years later. In the last stage, smoking prevalence declines and reaches a stable point for both sexes (Lopez et al. 1994). Later work linked this model to socioeconomic

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inequalities in smoking during the four stages. In the earlier stages of the epidemic, smoking is more common among the higher socioeconomic groups among both sexes. In the latter stages, while overall smoking prevalence rates decline, smoking becomes more common among groups with lower socioeconomic status. This reversal of the smoking gradient first occurs among men, to be followed by women (Huisman et al. 2005a).

Reverse inequalities in smoking in the south of Europe have often been interpreted in terms of the smoking epidemic. The southern countries, and especially the more peripheral countries and regions, are thought to be in less advanced stages of the epidemic (Lopez et al. 1994). Further support for this idea comes from the finding that the "old" pattern was found mostly among older female generations, while it seemed to be disappearing among younger generations. These countries seem to follow the course of the epidemic in the northern European countries, where smoking has developed from a high-class to a low-class habit (first among men, then among women) during the second half of the 20th century (Huisman et al. 2005b; Leinsalu et al. 2011).

If the situation in the southern European countries indeed reflects an unfolding of the smoking epidemic, one would expect to find a similar situation in other European countries that are less advanced socioeconomically. Eastern European studies also observed a gradual transition in which smoking had developed from a high-class to a low-class habit (Helasoja et al. 2006; Leinsalu et al. 2007). However, while smoking initiation has been strongly related to higher education among women in southern Europe, this reversed pattern has never been so marked in eastern Europe (Pudule et al. 1999; Pomerleau et al. 2004; Leinsalu et al. 2007, 2011). This suggests smoking inequalities in southern Europe may have been influenced by particularly southern factors, such as cultural influences protecting low-class women from smoking (Schaap et al. 2009).

Given these uncertainties, it would be of much interest to assess inequalities in smoking in other countries with similarities to southern Europe, such as some countries around the Mediterranean. Turkey may be of interest for several reasons. Traditionally, as in the south of Europe, smoking in Turkey is highly prevalent among men (43.8 %) while the prevalence is much lower among women (11.6 %) (Global Adult Tobacco Survey 2010). Furthermore, Turkey is of interest because of its large regional heterogeneity (Dincer et al. 2003; Ergin et al. 2012). On the one hand, the western and Mediterranean parts of Turkey are developed both socioeconomic and culturally, while most other parts are underdeveloped (General directorate on the status of women 2008). The position of women in Turkish society varies correspondingly, with women in the eastern part of Turkey being most oppressed in a patriarchal society (Ökten 2009).

Socioeconomic inequalities in smoking in Turkey have hardly been studied. Analysis of the Turkish Global Adult Tobacco Survey (GATS) showed that the percentage of smokers generally increased with educational level among women while there was no clear pattern for men. In a similar way, while smoking among Turkish men was not associated with level of urbanization, among Turkish women smoking was much more common in urban than in rural areas (14.5 vs. 5.0 %; compared with 44.0 vs. 43.6 % among men) (Global Adult Tobacco Survey 2010).

The aim of this paper is to assess whether socioeconomic inequalities in smoking across regions in Turkey have the same pattern as observed in southern Europe. We will pay particular attention to Turkish women, for whom we expect that:

(a) Smoking prevalence is elevated among individuals with higher socioeconomic position relative to those with lower socioeconomic position, especially for education.

(b) Smoking prevalence is elevated among individuals with higher educational level in all regions of Turkey, but especially in the least developed regions.

(c) Smoking prevalence is elevated among individuals with higher educational level especially among older Turkish women, though also among younger women.

We will test these hypotheses using data of the World Health Survey (WHS) for Turkey in 2002. This country data set is particularly useful because it has representative samples of each Turkish region, it covers a broad age group, and it includes both education and wealth measures.

Methods

Data

The WHS has been conducted in 69 countries, across all continents. It aimed to provide valid, reliable, representative and comparable population data on the health status of national populations. (World Health Survey 2002; Hosseinpoor et al. 2012). We analyzed WHS 2002 country data for Turkey, with the permission of the World Health Organization (WHO).

In the Turkish WHS, households were selected using a sample design based on a stratified probability proportional to size (PPS) method, with a two-stage collection of equal-sized clusters. The sampling frame consisted of five macro regions with urban/rural divisions for each. In total, 480 sample blocks were selected including each 25 households. Households were selected with equiprobability, by employing an inverse sample design. Per household, one individual was then selected through a random selection

procedure using the Kish table method (World Health Survey Report of Turkey 2012; Sozmen et al. 2012).

In total, 11,512 households were selected in the WHS. Data had been collected by means of face-to-face surveys. The response rate was 99 % at the household level and 98 % at the level of individual respondents. (World Health Survey Report of Turkey 2012) Household-level and individual-level questionnaire datasets were combined for our study. 263 unmatched data cases were excluded from analysis, which left 11,216 individual respondents for our analyses. Of these, we excluded 409 respondents below 20 years of age, 30 with missing data on key variables (three for age, 23 for smoking, four for wealth) and 370 occasional smokers. The data of the remaining 10,407 people were used for analyses.

Variables

The following independent variables were included in the analysis: age, sex, region, wealth and education. Age was measured in years. The study group was divided into two age groups; 20–39 years old represented "the younger" and 40 and above "the older" participants of the survey. Region was measured in terms of place of residence. The five regions distinguished in the WHS survey were West, Mediterranean, Middle, Black Sea and East. In terms of socioeconomic development scores (Dincer et al. 2003), a strong difference between regions had been documented. The most developed regions were in the West and the least developed in the East (Ergin et al. 2012).

Wealth was defined using ownership data on stereo systems, washing machine for clothes, washing machine for dishes, vacuum cleaner, refrigerator, fixed line telephone, mobile/cellular telephone, computer, access to the internet, subscriptions to magazines and/or newspaper, and a security system in the home (World Health Survey 2002). The answers to these 11 items were used to calculate the household wealth score. Those who had an item were scored as 1 on that item, while those who did not possess it were scored as 0. The evaluation of wealth using a dichotomous hierarchical ordered probit model was used for WHS country data of 48 low-income and middle-income countries by Hosseinpoor et al. (2012) and declared as a significant determinant of smoking in many countries. The sum score was grouped as 8–11 (highest), 6–7 (second highest), 5 (middle), 4 (second lowest) and 0–3 (lowest). This classification was used instead of another classification as it resulted in the most even distribution of respondents across wealth groups in most regions.

Educational level was measured by years of education, which were categorized as 0–4, 5–7 and 8 or more years. The 0–4 group included those who were illiterate or had not completed primary school education; 5–7 years

included those who had completed primary school but not secondary; while 8 years and above included those who had achieved school enrollment above secondary school in Turkey. Secondary school was the 3-year period between primary school and high school and 5 years of primary education was mandatory at the survey time.

The dependent variable of this study was current daily smoking status. In the WHS questionnaire, the questions about current smoking were based on WHO definitions (World Health Organization 1998). The answers to the smoking questions were used to classify respondents into three categories: current daily smoker, non-daily smoker (occasional smoker) and non-smoker.

Statistical analysis

We calculated age-standardized prevalence rates. We used the direct method of age standardization, with a distinction according to 10-year age groups. As the standard population, we used the Turkish population in the year of 2003 (Turkish Statistical Institute 2003).

For the evaluation of the association of smoking with wealth and education, logistic regression analysis was applied. Lowest education and lowest wealth groups were taken as the reference categories. In the first step, analyses were made per region. In these analyses, the associations for wealth and educational level were measured separately using regression models that control only for age (model 1). In the second step, analyses are made according to age group, for all regions together. Here, we first controlled for age only (model 1) and then controlled for age, region, education and wealth (model 2). Analyses were made separately for the two sexes.

Results were presented as odds ratios with 95 % confidence intervals. Prevalence rates and odds ratios showed a number of discrepancies when used to quantify the size of socioeconomic inequalities in smoking. These discrepancies were due to small number of respondents in some age groups, which affected the standardized prevalence rates in particular. Considering this, we use prevalence rates mostly to show the absolute prevalence of smoking, while odds ratios will be used to study socioeconomic inequalities in smoking.

Results

Table 1 shows the distribution of the surveyed population according to sex, socioeconomic indicators and region. Among the total surveyed population, 41.7 % of women and 40.3 % of men belonged to wealth levels equal to or below the middle. While the highest wealth groups predominated in the West (26.4 % of women and 28.1 % of

Table 1 The distribution of the surveyed population (in % of total population, N) according to sex, socioeconomic indicators and region, World Health Survey Turkey 2002

	West	Mediterranean	Middle	Black Sea	East	Total
Women	$N = 1,954$	$N = 782$	$N = 941$	$N = 705$	$N = 1,569$	$N = 5,951$
Wealth groups						
Highest	26.4	23.4	19.7	20.4	14.0	21.0
Second highest	42.8	35.9	36.9	37.0	31.4	37.3
Middle	16.8	16.2	17.6	17.2	17.7	17.1
Second lowest	6.6	10.5	11.3	9.9	13.0	9.9
Lowest	7.4	13.9	14.6	15.5	23.8	14.7
Education groups (years)						
≥8	27.0	26.3	23.4	25.1	15.4	23.1
5–7	49.4	48.3	49.2	43.0	38.6	45.6
0–4	23.6	25.3	27.4	31.9	46.0	31.3
Men	$N = 1,384$	$N = 589$	$N = 666$	$N = 541$	$N = 1,276$	$N = 4,456$
Wealth groups						
Highest	28.1	25.5	20.1	27.2	12.9	22.1
Second highest	43.6	38.7	34.2	35.5	33.2	37.6
Middle	14.5	16.0	15.3	17.7	17.3	16.0
Second lowest	6.4	8.8	14.6	8.7	12.1	9.9
Lowest	7.4	11.0	15.8	10.9	24.5	14.4
Education groups (years)						
≥8	44.1	38.2	39.5	48.6	33.9	40.2
5–7	46.4	50.4	50.0	41.0	49.2	47.6
0–4	9.5	11.4	10.5	10.4	16.9	12.1

men), the lowest wealth groups were the largest groups in the East (23.8 % of women and 24.5 % of men). For education, the predominating groups were middle (5–7 years) education groups (45.6 % for women and 47.6 % for men). Regionally, the highest education group was largest in the West (27.0 % of women and 44.1 % of men), while in the East, the lowest education groups composed the majority of the female population (46.0 % of women and 16.9 % of men). Together, these data show the East to be the most deprived region, while the West was the least deprived.

Figure 1 shows the geographic distribution of age-standardized prevalences of current daily smoking status for two sexes in the young (20–39) and old (40 and above) groups. The overall age-standardized prevalence for current daily smoking was 16.7 % for women and 51.4 % for men. The prevalence range was 48.7–56.1 % for men and 13.1–19.1 % for women. The highest prevalence was in the Black Sea region for men and in the West for women. The lowest prevalence was in the East for both sexes.

The age-standardized prevalence rates and odds ratios for current daily smoking according to wealth group, sex and region are presented in Table 2. Among women, for the country as a whole, the prevalence rates and odds ratios showed an increasing gradient from lowest to highest

wealth groups. The highest wealth group had 3.6-times increased odds. The size of these inequalities differed between regions. In the East and Middle regions, the inequalities were largest, with 4.9 and 4.7-times higher odds of the highest compared with the lowest educational groups. Among men, in the country as a whole, the two highest wealth groups showed a lower prevalence of smoking. Within specific regions, wealth was not systematically related to current daily smoking, although significant differences were observed in the West and the Black Sea region.

The age-standardized prevalence rates and odds ratios for current daily smoking according to wealth group, sex and region are presented in Table 3. Among women, for the country as a whole, the prevalence rates and odds ratios showed an increasing gradient from lowest to highest education groups. The highest education group had 4.9-times increased odds of smoking, compared with the lowest group. A similar gradient was observed in all the regions, with statistical significance except for the Mediterranean region. In the Black Sea, Middle and East regions, the size of inequalities was larger than in the other regions, with 8.1, 7.1 and 6.0-times higher odds of smoking in the highest compared with the lowest educational group. Among men, education was not systematically related to
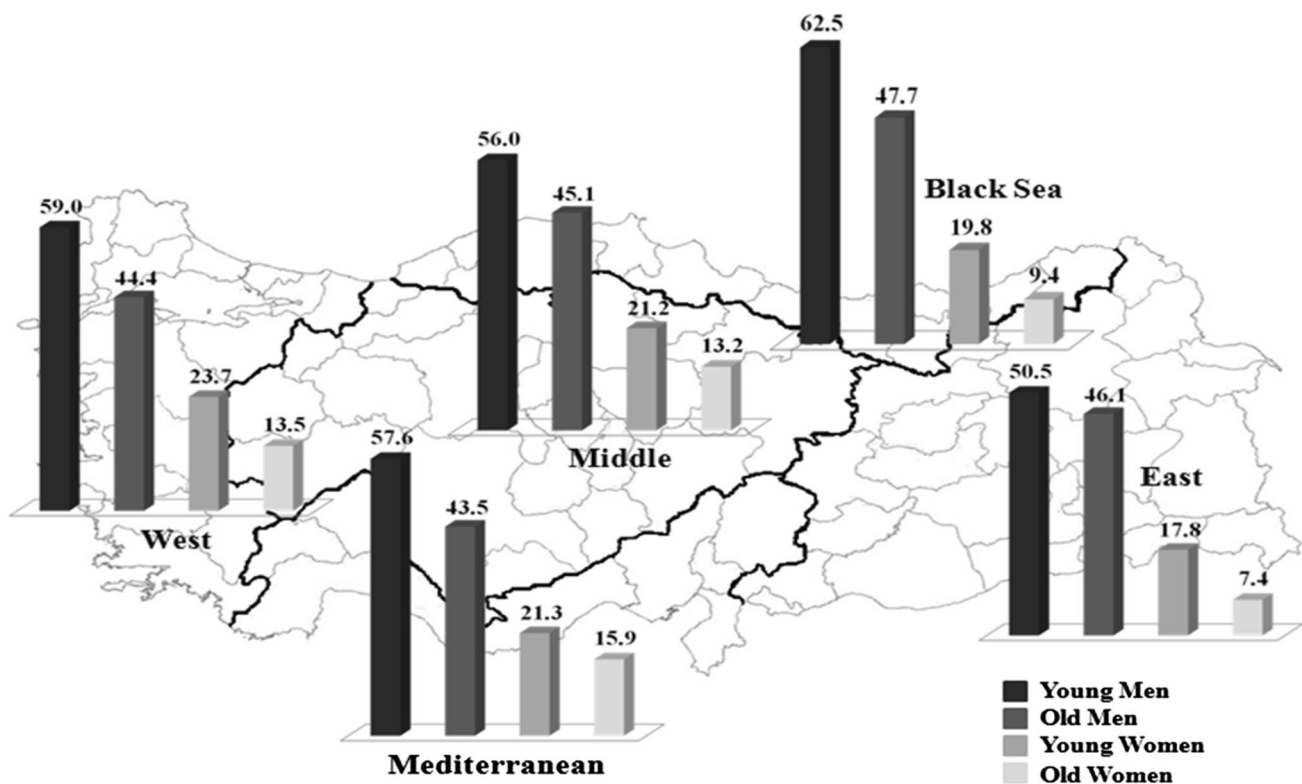
Fig. 1 Age-standardized prevalence of current daily smoking status by sex (men/women), age groups (young "20–39"/old "40 and above") and region (%), World Health Survey Turkey 2002, N (female = 6,156, male = 4,621)

current daily smoking for the country as a whole, nor in any of the regions.

Table 4 presents the odds ratios for current daily smoking according to region, wealth and education group for men and women in two age groups (20–39 and above). For women, a clear regional pattern existed for the older age grouping, with increasing prevalence rates from the East towards the West region. The association with wealth was observed among both younger and older women. After controlling for all variables (model 2), the association remained in the younger group, but it became statistically non-significant in the older age group. For education, the positive association with smoking was observed among both younger and older women. This educational gradient was more pronounced among the older than the younger group after control for other variables (model 2).

For men, no regional differences in smoking were observed for the older age group, while a significant increase in smoking in the West and Black Sea regions was observed in the younger age group. These regional variations remained, though to a smaller extent, after adjustment for socioeconomic variables. The associations for wealth and education were inverse to those observed for women, with odds ratios smaller than one and the socioeconomic differences were small in all regions.

Discussion

In this paper, we tested a series of hypotheses with regards to smoking in Turkey, and especially among Turkish women. Assuming that previous results from the south of Europe reflect more generalized trends, and that these trends would be occurring in Turkey as well, we formulated three hypotheses. Our results are to a large extent in agreement with these hypotheses. We observed, as expected, that:

(a) Smoking prevalence is elevated among women with higher socioeconomic position relative to those with lower socioeconomic position, especially for education.
(b) Smoking prevalence is elevated among women with higher educational level in all regions of Turkey, but especially in the least developed regions.
(c) Smoking prevalence is elevated among women with higher educational level especially among older Turkish women, though also among younger women.

Data limitations

We used WHS 2002 data because a more recent country-representative dataset with the necessary variables was not

Table 2 The age-standardised prevalence rates and odds ratios for current daily smoking according to wealth groups, per sex and region, World Health Survey Turkey 2002

	Women		Men	
	Prevalence rate (%)	Odds ratio (95 % CI)	Prevalence rate (%)	Odds ratio (95 % CI)
Turkey				
Highest	22.99	3.64 (2.72–4.86)**	50.69	0.80 (0.65–0.99)*
Second highest	17.79	2.48 (1.87–3.29)**	49,01	0.74 (0.61–0.90)*
Middle	14.43	1.93 (1.40–2.65)**	55.54	0.94 (0.75–1.17)
Second lowest	12.82	1.62 (1.13–2.34)*	51.69	0.85 (0.66–1.09)
Lowest (ref)	8.21	1.00	55.55	1.00
West				
Highest	22.21	2.19 (1.20–3.99)*	51.06	0.61 (0.38–0.98)*
Second highest	19.84	1.77 (0.98–3.19)	48.15	0.53 (0.34–0.83)**
Middle	15.72	1.31 (0.69–2.51)	60.52	0.87 (0.520–1.45)
Second lowest	15.41	1.20 (0.56–2.59)	61.95	0.82 (0.45–1.51)
Lowest (ref)	13.16	1.00	66.40	1.00
Mediterranean				
Highest	20.75	2.52 (1.15–5.51)*	44.72	0.57 (0.31–1.05)
Second highest	20.69	2.07 (0.96–4.44)	54.20	0.98 (0.55–1.75)
Middle	15.63	1.50 (0.63–3.58)	55.83	1.02 (0.53–1.97)
Second lowest	18.23	1.62 (0.62–4.21)	56.35	1.04 (0.49–2.23)
Lowest (ref)	10.65	1.00	56.45	1.00
Middle				
Highest	29.05	4.65 (2.25–9.62)**	55.70	0.88 (0.51–1.52)
Second highest	15.60	2.19 (1.07–4.45)*	49.44	0.65 (0.39–1.07)
Middle	19.43	2.71 (1.26–5.85)*	46.75	0.54 (0.30–0.97)*
Second lowest	11.68	1.43 (0.59–3.48)	46.93	0.66 (0.36–1.19)
Lowest (ref)	8.71	1.00	60.09	1.00
Black Sea				
Highest	17.87	3.12 (1.22–7.95)*	51.00	0.49 (0.25–0.96)*
Second highest	18.15	2.85 (1.16–7.02)*	56.10	0.55 (0.29–1.05)
Middle	7.06	0.86 (0.27–2.69)	58.99	0.53 (0.26–1.09)
Second lowest	12.56	2.10 (0.70–6.33)	50.71	0.46 (0.20–1.05)
Lowest (ref)	8.15	1.00	66.15	1.00
East				
Highest	24.06	4.86 (2.88–8.21)**	51.95	1.01 (0.68–1.49)
Second highest	14.19	2.53 (1.55–4.12)**	44.01	0.76 (0.56–1.04)
Middle	13.14	2.28 (1.31–3.98)*	54.19	1.15 (0.80–1.65)
Second lowest	9.73	1.64 (0.87–3.10)	47.68	0.94 (0.63–1.40)
Lowest (ref)	6.37	1.00	47.85	1.00

The odds ratios are adjusted for age * $p < 0.05$, ** $p < 0.001$

available. The accuracy of self-reporting for smoking has been questioned. While several studies have found evidence for underreporting (Vasankari et al. 2011), most have found self-reports of smoking to be reasonably reliable, consistent (Vartiainen et al. 2002; Rebagliato 2002; Studts et al. 2006) and accurate (Patrick et al. 1994). Although this remains a potential bias, we think that the observed patterns of socioeconomic and regional inequalities cannot be fully explained by underreporting. If

underreporting of smoking varied by education or income, our results might be biased. Earlier studies that investigated underreporting in relation to socioeconomic status did not show significant effects or consistent results (Wagenknecht et al. 1992; Suadicani et al. 1994; Van Loon et al. 2003). Nonetheless, in Turkey, the response of Turkish women in traditional groups may be biased, especially if restrictive norms provoke socially desirable answers. Many previous studies used income, instead of wealth, as measures of

Table 3 The age-standardised prevalence rates and odds ratio for current daily smoking according to education groups, per sex and region, World Health Survey Turkey 2002

	Women		Men	
	Prevalence rate (%)	Odds ratio (95 % CI)	Prevalence rate (%)	Odds ratio (95 % CI)
Turkey (years)				
≥8	29.72	4.87 (3.87–6.11)**	49.61	0.80 (0.64–1.00)
5–7	14.20	1.88 (1.51–2.34)**	53.39	0.90 (0.73–1.11)
0–4 (ref)	9.29	1.00	53.10	1.00
West (years)				
≥8	27.37	2.97 (1.99–4.42)**	50.82	0.70 (0.46–1.08)
5–7	17.02	1.58 (1.08–2.31)*	54.25	0.78 (0.52–1.18)
0–4 (ref)	13.88	1.00	65.35	1.00
Mediterranean (years)				
≥8	32.32	2.96 (1.58–5.57)*	47.91	0.62 (0.33–1.16)
5–7	11.98	0.83 (0.44–1.56)	54.77	0.82 (0.45–1.49)
0–4 (ref)	18.36	1.00	59.45	1.00
Middle (years)				
≥8	33.10	7.08 (3.89–12.89)**	53.36	1.27 (0.69–2.35)
5–7	13.58	1.96 (1.10–3.50)*	51.22	1.05 (0.58-1.91)
0–4 (ref)	7.60	1.00	54.60	1.00
Black Sea (years)				
≥8	26.20	8.11 (3.36–19.54)**	51.61	0.78 (0.38–1.61)
5–7	12.11	2.81(1.19–6.63)*	64.66	1.28 (0.63–2.57)
0–4 (ref)	10.03	1.00	45.84	1.00
East (years)				
≥8	31,86	5.99 (3.83–9.37)**	45.17	0.74 (0.51–1.07)
5–7	12.92	2.26 (1.50–3.40)**	50.43	0.88 (0.62–1.24)
0–4 (ref)	6.69	1.00	49.09	1.00

The odds ratios are adjusted for age * $p < 0.05$, ** $p < 0.001$

economic deprivation (Schaap and Kunst 2009). However, income does not represent the broad spectrum of material deprivation. We used wealth to measure financial situation over the previous years as well as cumulative prosperity. It has been suggested that smoking prevalence is related more strongly to accumulated wealth other than income (Stronks et al. 1998; Schaap et al. 2008).

Interpretation of results

The patterns observed for Turkey closely correspond to those expected on the basis of the smoking epidemic model. Turkey seems to be in an early phase of this model, given our findings that (a) smoking among Turkish women has a strong positive association with educational level, with particular strength in the less developed regions and (b) this positive association is also observed in the more developed regions (to a lower extent than in the less developed regions) and among younger generations. For men, the educational and wealth related inequalities showed no systematic or strong regional or socioeconomic variation. More specifically, these findings suggest Turkey to be in phase 2, where smoking is strongly associated with higher education among women, but not anymore among men (Lopez et al. 1994).

The largest difference between high and low educated women is observed in the less developed regions in the Mid, North and East of Turkey. This pattern is observed especially among older women. Similarly, analyses of the Turkish GATS survey data found smoking prevalence to be much lower among women in rural areas than in urban areas (Global Adult Tobacco Survey (GATS) 2010). The low smoking prevalence of lower educated, older and rural women is related to several factors, including the low labour force participation of these women, the weak social position of women in their families, and the conservative, patriarchal nature of their communities. In addition, smoking may be restrained by a strong taboo on women's smoking (General directorate on the women's status 2008; Turkish Statistical Institute 2011; Ökten 2009). The lower

Table 4 Odds ratios for current daily smoking according to region, wealth, education groups for two sexes per age groups (20–39/40 and above), World Health Survey Turkey 2002

	Women		Men	
	Model 1 Odds ratio (95 % CI)	Model 2 Odds ratio (95 % CI)	Model 1 Odds ratio (95 % CI)	Model 2 Odds ratio (95 % CI)
Young (20–39 years)				
Region				
West	1.44 (1.14–1.81)*	1.12 (0.88–1.42)	1.37 (1.10–1.72)*	1.48 (1.17–1.87)*
Mediterranean	1.30 (0.98–1.71)	1.07 (0.81–1.43)	1.20 (0.91–1.59)	1.24 (0.93–1.65)
Middle	1.22 (0.90–1.66)	0.96 (0.70–1.31)	1.29 (0.96–1.75)	1.36 (1.00–1.85)*
Black Sea	1.20 (0.87–1.64)	0.90 (0.65–1.25)	1.65 (1.21–2.26)*	1.78 (1.29–2.44)**
East (ref)	1.00	1.00	1.00	1.00
Wealth				
Highest	3.39 (2.37–4.85)**	1.92 (1.29–2.84)*	0.86 (0.64–1.16)	0.80 (0.57–1.13)
Second highest	2.37 (1.68–3.34)**	1.65 (1.14–2.38)*	0.77 (0.58–1.01)	0.72 (0.53–0.97)*
Middle	1.96 (1.32–2.92)*	1.59 (1.06–2.39)*	0.98 (0.70–1.37)	0.91 (0.64–1.30)
Second lowest	1.86 (1.20–2.88)*	1.62 (1.04–2.52)*	0.88 (0.62–1.26)	0.84 (0.58–1.21)
Lowest (ref)	1.00	1.00	1.00	1.00
Education (years)				
≥8	3.78 (2.75–5.19)**	2.98 (2.09–4.25)**	0.98 (0.66–1.47)	1.02 (0.66–1.57)
5–7	1.58 (1.16–2.16)*	1.36 (0.98–1.89)	1.22 (0.81–1.84)	1.26 (0.83–1.92)
0–4 (ref)	1.00	1.00	1.00	1.00
Old (40 and above)				
Region				
West	2.02 (1.44–2.84)**	1.42 (0.99–2.02)	0.95 (0.76–1.18)	1.02 (0.81–1.28)
Mediterranean	1.97 (1.33–2.92)*	1.64 (1.09–2.46)*	0.96 (0.74–1.25)	0.99 (0.76–1.30)
Middle	2.38 (1.59–3.56)**	1.69 (1.11–2.58)*	0.94 (0.72–1.24)	0.99 (0.75–1.31)
Black Sea	1.32 (0.83–2.12)	1.12 (0.69–1.82)	1.07 (0.81–1.42)	1.12 (0.84–1.50)
East (ref)	1.00	1.00	1.00	1.00
Wealth				
Highest	4.13 (2.50–6.82)**	1.62 (0.93–2.83)	0.75 (0.56–1.00)	0.78 (0.56–1.07)
Second highest	2.73 (1.67–4.44)**	1.62 (0.96–2.72)	0.71 (0.55–0.93)*	0.74 (0.56–0.99)*
Middle	1.89 (1.10–3.25)*	1.43 (0.82–2.49)	0.90 (0.67–1.22)	0.93 (0.68–1.27)
Second lowest	1.20 (0.61–2.34)	1.03 (0.52–2.02)	0.82 (0.57–1.17)	0.84 (0.58–1.20)
Lowest (ref)	1.00	1.00	1.00	1.00
Education (years)				
≥8	6.45 (4.63–8.97)**	4.90 (3.35–7.17)**	0.78 (0.60–1.02)	0.87 (0.64–1.17)
5–7	2.08 (1.53–2.84)**	1.71 (1.23–2.38)*	0.80 (0.62–1.02)	0.85 (0.66–1.09)
0–4 (ref)	1.00	1.00	1.00	1.00

Model 1, adjusted for age; model 2, adjusted for age, region, wealth and education

* $p < 0.05$, ** $p < 0.001$

level of tobacco use thus does not reflect a high level of health awareness, but rather conservative social traditions or religiosity and women's low economic resources (Mckay and Amos 2003).

The highest smoking prevalence rates are reached by women with high education (about 30 %) rather than women with high income (about 22 %). Interestingly, this smoking prevalence is reached by highly educated women of all regions, including those living in the Mid, North and East of Turkey. This suggests an intimate link between women's educational level and the risk of smoking. Among highly educated Turkish women, smoking may be related to a changing attitude shaped with symbolic meanings around what she eats and drinks and how she dresses. In the struggle with tradition, smoking is a symbol of emancipation, freedom and independence. As for women in

southern Europe, the cigarette represents a new role and identity (Amos and Haglund 2000; Anderson et al. 2005; Afifi et al. 2010; Hitchman and Fong 2011).

While high education was the most important determinant of smoking among women, wealth played an additional role. Wealth may exert its additional impact through increased purchasing power and increased status in the society derived from purchasing power. In addition, wealth may be important if smoking is an expensive activity for poor women. However, in Turkey cigarettes are cheaper and tax revenues are much lower than in many EU countries (Yürekli et al. 2010). While a similar reason may apply to men, wealth was not related to smoking among men. This underlines the importance of gender-specific sociocultural conditions: wealth may imply reaching the status of independence for Turkish women, and this status is symbolized by smoking (Amos and Haglund, 2000; Schaap et al. 2009).

After controlling for education and wealth, regional differences in the overall prevalence of smoking were modest. However, among men, smoking was found to be more common in the West and Black Sea regions (see Table 4). A smoking prevalence study from the Black Sea region concluded that the highest prevalences were found among men 20–29 and 30–39 years of age (51.4 % and 56.9 %, respectively) (Çan et al. 2007). The West and North regions include the main tobacco production areas of Turkey. Tobacco plantations and cigarette factories, established along the coasts of the Black Sea, date back to 1835. In 1909, the city of Samsun had been reported as the first "cigarette" consuming city of the Ottoman Empire. The production in the region had accelerated with government-financed factories by the beginning of the new republic in 1923 (Erler and Edinsel 2011). International studies have found that a high level of tobacco production has gone hand in hand with high consumption levels (Murphy and Price 1988; Thrasher et al. 2004). Our regional comparison suggests that a similar association holds within Turkey, at least among men.

Conclusions

In Turkey, male smoking tends to be more common among lower socioeconomic groups while female smoking is much more common in higher socioeconomic groups. Socioeconomic differences in male smoking are approximately equally large in all regions. Patterns of socioeconomic inequalities in smoking in Turkey strongly resemble those observed in southern European countries. More generally, smoking inequalities in Turkey fit the patterns predicted by the smoking epidemic model, with Turkey still being in an early stage. In all regions, about half of the men smoked, and smoking was more pronounced in young men. Particular attention should be given to highly educated women. In all regions of Turkey, about three out of 10 highly educated women smoked. To prevent a further increase in smoking, and the trickling down of smoking towards lower educated women, efforts should be made to counteract the idea of smoking as a symbol of modernity, emancipation and independence.

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