

# Prevalence of smoking and age of initiation in Alexandria, Egypt

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معدل انتشار التدخين، وسن البدء بالتدخين في الإسكندرية، مصر  
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**الخلاصة:** تم إجراء مسح مستعرض شمل جميع القطاعات حول تعاطي التبغ في مدينة الإسكندرية، في مصر، باستخدام استبيان مرتكز على الدلائل الإرشادية لمنظمة الصحة العالمية، يتم استكماله أثناء مقابلة المُستجِوبين. وقد أجريت الدراسة في عام ألفين وشملت 2120 مشاركاً يتراوح عمرهم من 15 إلى 86 عاماً. وكان أكثر من ربع المشاركين (27.2%) من المدخنين الحاليين (25.5%) يدخنون يومياً، و1.7% من المدخنين غير المنتظمين، في حين كان 3.5% منهم ممن سبق له التدخين. وبيّنت الدراسة أن المدخنين الحاليين ينفقون 23.1% من دخل الأسرة على التبغ. كما بيّنت الدراسة أن معدل انتشار التدخين أعلى بين الرجال (48.5%) منه لدى النساء (1.5%)، وأن متوسط سن البدء بالتدخين أقل بين الرجال (18.1 عاماً) منه لدى النساء (22.6 عاماً). وثبّت قلق من ارتفاع معدل انتشار تعاطي التبغ بين الرجال، ومن احتمالات زيادة انتشاره بين النساء. ويستلزم الأمر مزيداً من الدراسة للعوامل التي تقى من الشروع في التدخين والتي تساعد على الإقلاع عنه.

**ABSTRACT** A cross-sectional survey on tobacco use in the city of Alexandria, Egypt, used an interview questionnaire based on World Health Organization guidelines. The study in 2000 included 2120 participants aged 15 to 86 years. More than a quarter (27.2%) were current smokers (25.5% daily smokers and 1.7% occasional smokers) and 3.5% were ex-smokers. Current smokers spent 23.1% of their family income on tobacco. The prevalence of current smoking was significantly higher among men (48.5%) than women (1.5%) and the mean age of initiation of smoking was lower among men (18.1 years) than women (22.6 years). The high prevalence of tobacco use among men is of concern, so too is the likelihood that tobacco use will increase among women. Further research is needed into factors that prevent people from starting smoking and assist them stopping smoking.

## Prévalence du tabagisme et âge de l'initiation tabagique à Alexandrie (Egypte)

**RESUME** Une enquête transversale sur la consommation de tabac dans la ville d'Alexandrie (Egypte) a été réalisée à l'aide d'un questionnaire par entretien basé sur les directives de l'Organisation mondiale de la Santé. L'étude menée en 2000 comprenait 2120 participants âgés de 15 à 86 ans. Plus d'un quart des participants (27,2 %) étaient fumeurs au moment de l'étude (25,5 % de fumeurs quotidiens et 1,7 % de fumeurs occasionnels) et 3,5 % étaient des anciens fumeurs. Les fumeurs dépensaient 23,1 % de leur revenu familial pour le tabac. La prévalence du tabagisme au moment de l'étude était significativement plus élevée chez les hommes (48,5 %) que chez les femmes (1,5 %) et l'initiation tabagique avait lieu à un âge moyen plus jeune chez les hommes (18,1 ans) que chez les femmes (22,6 ans). La forte prévalence de la consommation de tabac chez les hommes est préoccupante, tout comme la probabilité de voir le tabagisme augmenter chez les femmes. D'autres recherches sont nécessaires sur les facteurs qui dissuadent les gens de commencer à fumer ou les aident à arrêter de fumer.

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## Introduction

The use of tobacco has been described as a global epidemic, with rates of smoking peaking among men in most industrialized countries but increasing now among men in developing countries and women in virtually all countries [1]. Since the mid 1980s the estimated annual global cigarette consumption has remained constant at a rate of 1600 cigarettes per adult per year [2,3]. This is because the decline in industrialized countries has been offset by an increase in developing countries [2]. In industrialized countries, per capita cigarette consumption is falling at a rate of about 1.5% per year, whereas it is increasing by 1.7% per annum in developing countries [4,5]. Now that sales of tobacco products are decreasing in the United States and western Europe, owing to the growing awareness of the health risks of smoking, the tobacco industry is increasingly targeting the developing world as a source of new markets [5].

Information on tobacco consumption and prevalence of use are key indicators that should be monitored by each country to draw attention to smoking and health issues [6,7] and to support anti-smoking measures [4,5]. When repeated at regular intervals, such surveys illustrate trends over time and suggest priorities for tobacco control interventions [6,7]. Indeed, collecting information on tobacco use is one of the main components of the plan of action of the World Health Organization (WHO) for the years 1966–2000 [8].

In Egypt, the last community-based tobacco survey, conducted in Cairo in 1982 [9], revealed a prevalence of tobacco use of 39.8% among men and 1.0% among women. The study aimed to discover what changes have taken place since 1982. To portray the whole scope of the problem for broad age groups as well as for men and

women, a cross-sectional survey was conducted in the city of Alexandria between May and August 2000, targeting people aged 15 years and older.

## Methods

### Sampling technique

A cluster sample technique was used. To obtain an adequate sample size to ensure the reliability of the estimated prevalence, the sample size was calculated as described by Lwanga et al. [10] using the prevalence of smoking reported by the 1982 Cairo survey [9]. We assumed a 0.40 prevalence of tobacco use ( $p$ ) and 0.60 prevalence of non-use ( $q$ ) with a degree of precision ( $d$ ) of 0.03 at 95% confidence intervals along with a correction for design effect. The sample size was calculated by the following equation  $[(Z^2 \times p \times q)/(d^2)] \times 2$ . The sample size was calculated based on the higher prevalence of tobacco use, namely that among men, to obtain a larger sample size. The total number of subjects estimated was 2048, equally distributed over the 30 identified clusters.

In the 30 clusters, 1017 households were surveyed. Subjects aged 15 years and older were eligible to participate in the interview. A total of 127 of 2247 eligible subjects refused the interview, resulting in a non-response rate of 5.7%. A proportion of non-respondents were substituted from the same district. Excluding interviews where data was missing, the total sample reached was 2120 subjects.

### Questionnaire

The households selected were first visited and information was collected on households on a separate sheet. Then all eligible participants were interviewed.

Data were collected using a pre-tested, pre-coded interview questionnaire. Section I covered the demographic characteristics of the surveyed households (family size, number of rooms and family income) and the participants (age, sex, education, occupation, and marital status).

Section II covered the status and pattern of tobacco use. Based on household information, status of tobacco use was assessed by the percentage of current smokers in the household. Based on interviews with participants, tobacco use was defined based on the WHO core questions for tobacco surveys [5] as follows: current smokers (daily smokers and occasional smokers); non-smokers (ex-smokers and never smokers); and ever smokers.

Questions about patterns of tobacco use included: type and amount of tobacco products consumed, age of initiation of smoking, duration of tobacco use and state of nicotine dependence for daily smokers (the time lapse between waking up and the first cigarette of the day). For occasional smokers, the weekly average consumption was divided by seven to represent the daily consumption. This was useful for comparing amount of tobacco used between daily and occasional smokers. For hookah smokers, the amount of tobacco used in one *hagar* was calculated as equivalent to about 2.5 cigarettes [11].

### Data analysis

Data for families and for interviewed participants were analysed using *SPSS*, version 8 and *Epi-Info*, version 6.04. The prevalence of smoking and the corresponding 95% confidence intervals as well as the mean, standard deviation (*s*) and the 95% confidence intervals (CI) of the mean were computed. The chi-square and Student *t*-test were used to test the significance of the results at the 5% level.

## Results

Of the 2120 participants in the study, 1162 were men (54.8%) and 958 women (45.2%). The age range was from 15 to 86 years (mean 35.01  $\pm$  standard deviation 13.81 years). Excluding students and those below the legal age of marriage of 18 years ( $n = 309$ , 14.5%), the majority of eligible participants were married (77.5%); the remainder were single (21.0%) divorced or widowed (1.5%).

Among the participants, 10.8% ( $n = 228$ ) were students at different educational levels. For the remainder ( $n = 1892$ ), nearly half (51.2%) were illiterate or just able to read and write, 14.3% had finished basic education, 22.9% had a high school certificate and 11.6% were university graduates. Excluding students, a minority of women ( $n = 117$ , 13.6%) and the majority of men ( $n = 875$ ; 84.8%) were employed at the time of the survey. For employed men, more than half (53.0%) were manual labourers, 18.2% were drivers, traders and fisherman, while the others were professionals or semiprofessionals (15.3%) and skilled or semiskilled workers (13.5%).

Only a quarter of the 1017 surveyed households (24.4%) were tobacco-free, whereas 75.6% had up to 6 household members who were current smokers (mean 1.26  $\pm$  0.62 smokers per household). Tobacco-free households were similar to those with current smokers with respect to family size (6.97  $\pm$  1.86 versus 7.03  $\pm$  1.88,  $P = 0.665$ ), number of persons per room (1.69  $\pm$  0.97 versus 1.80  $\pm$  0.97,  $P = 0.101$ ) and per capita monthly income (86.11  $\pm$  67.69 Egyptian pounds (LE) versus 79.82  $\pm$  53.82 LE,  $P = 0.135$ ).

Of the 5067 total inhabitants of the surveyed households, 4153 were over the age of 15 years, and 1050 of them were report-

Table 1 Patterns of tobacco use by sex

Tobacco use	Men (n = 1162)			Women (n = 958)			Total (n = 2120)		
	No.	%	95% CI	No.	%	95% CI	No.	%	95% CI
Current smokers	563	48.5	45.63 to 51.37	14	1.5	0.74 to 2.26	577	27.2	25.31 to 29.09
Daily smokers	529	45.5	42.64 to 48.36	11	1.1	0.44 to 1.76	540	25.5	23.35 to 27.05
Occasional smokers	34	2.9	1.94 to 3.86	3	0.4	-0.04 to 0.64	37	1.7	1.55 to 2.25
Non-smokers	599	51.6	48.68 to 54.42	944	98.5	97.79 to 99.29	1543	72.8	70.89 to 74.67
Ex-smokers	70	6.0	4.64 to 7.36	4	0.4	0.01 to 0.79	74	3.5	2.72 to 4.28
Never smokers	529	45.5	42.64 to 48.36	940	98.1	97.24 to 98.96	1469	69.3	67.34 to 71.26
Ever smokers	633	54.5	51.64 to 57.36	18	1.9	1.04 to 2.76	651	30.7	28.74 to 32.66

n = total number of interviewees.

ed to be current smokers, yielding a smoking prevalence of 25.3% in the households. Among the 3866 people living in households with current smokers, 2816 (72.8%) were exposed to smoke and a quarter of these passive smokers ( $n = 728$ ; 25.9%) were children below the age of 15 years.

Table 1 summarizes the use of tobacco products among interviewed participants. Nearly one-third of interviewees (30.7%) were ever users of any tobacco products. The prevalence of current smoking was 27.2%, which was similar to the 25.3% estimated prevalence based on information from households ( $\chi^2_1 = 2.730$ ,  $P = 0.0982$ ). The prevalence of daily smoking was much higher (25.5%) than that of occasional smoking (1.7%) (Table 1).

Ever-use of tobacco products was reported by a significantly higher percentage of men (54.5%) than women (1.9%). Just less than half of the surveyed men were current smokers (48.5%) compared with only 1.5% of women. The prevalence of daily smoking was significantly higher among men (45.5%) than women (1.1%). Similarly, the proportion of occasional smokers was significantly higher among men (2.9%) than women (0.4%). Few participants were ex-smokers (3.5%). The proportion of ex-smokers was significantly higher among men (6.0%) than women (0.4%) (Table 1).

Examining tobacco use among men in 10-year age intervals (Table 2) revealed that the highest proportion of ever smokers (67.6%) was among those aged 45–55 years. This age group also had the highest proportion of current smokers (63.8%), particularly daily smokers (61.1%). On the other hand, the highest prevalence of occasional smokers (6.8%), was in the 65+ years age group. The 25–35 year age group had the highest proportion of ex-smokers (7.7%). In the 15–25 year age group, the

Table 2 Patterns of tobacco use by age and sex

Age group (years)	Men			Women		
	No.	%	95% CI	No.	%	95% CI
<i>Current smokers</i>						
15-24	85	28.1	23.04 to 33.16	3	1.1	-0.13 to 2.33
25-34	126	48.5	42.43 to 54.57	1	0.4	-0.36 to 1.16
35-44	141	58.8	52.57 to 65.03	6	2.8	0.58 to 5.02
45-54	138	63.8	57.39 to 70.21	1	0.7	-0.66 to 2.06
55-64	51	51.5	41.66 to 61.34	3	6.1	-0.60 to 12.80
65+	22	50.0	35.23 to 64.77	0	0	
<i>Daily smokers</i>						
15-24	78	25.7	20.78 to 30.62	2	0.7	-0.28 to 1.68
25-34	120	46.2	40.12 to 52.26	0	0	
35-44	133	55.4	49.12 to 61.68	5	2.4	0.34 to 4.46
45-54	132	61.1	54.60 to 67.60	1	0.7	-0.66 to 2.06
55-64	47	47.5	37.67 to 57.33	3	6.1	-0.60 to 12.80
65+	19	43.2	28.56 to 57.84	0	0	
<i>Occasional smokers</i>						
15-24	7	2.3	0.62 to 3.98	0	0	
25-34	6	2.3	0.48 to 4.12	1	0.4	-0.36 to 1.16
35-44	8	3.3	1.04 to 5.56	3	1.4	-0.18 to 2.98
45-54	6	2.8	1.68 to 3.92	0	0	
55-64	4	4.0	0.14 to 7.86	0	0	
65+	3	6.8	-0.64 to 14.24	0	0	
<i>Ex-smokers</i>						
15-24	18	5.9	3.25 to 8.55	0	0	
25-34	20	7.7	4.46 to 10.94	1	0.4	-0.36 to 1.16
35-44	15	6.3	3.23 to 9.37	3	1.4	-0.18 to 2.98
45-54	8	3.7	2.42 to 4.98	0	0	
55-64	7	7.1	2.05 to 12.15	0	0	
65+	2	4.5	-1.63 to 10.63	0	0	
<i>Never smokers</i>						
15-24						
25-34	200	66.0	60.67 to 71.33	271	98.9	99.67 to 100.13
35-44	114	43.8	37.77 to 49.83	258	99.2	98.12 to 100.28
45-54	84	35.0	28.97 to 41.03	202	95.7	92.97 to 98.43
55-64	70	32.4	26.16 to 38.64	142	99.3	97.93 to 100.66
65+	41	41.4	31.70 to 51.10	46	93.9	87.19 to 100.00
<i>Ever smokers</i>						
15-24	103	34.0	28.60 to 39.33	3	1.1	-0.13 to 2.33
25-34	146	56.2	50.17 to 62.23	2	0.8	-0.28 to 1.88
35-44	156	65.0	58.97 to 71.03	9	4.3	1.57 to 7.03
45-54	146	67.6	61.36 to 73.84	1	0.7	-0.66 to 2.06
55-64	58	58.6	48.90 to 68.3	3	6.1	-0.60 to 12.80
65+	24	54.5	39.79 to 69.21	0	0	

Total number of interviewees for men: 15-24 yrs (n = 303); 25-34 yrs (n = 260); 35-44 yrs (n = 240); 45-54 yrs (n = 216); 55-64 yrs (n = 99); 65+ yrs (n = 44)

Total number of interviewees for women: 15-24 yrs (n = 274); 25-34 yrs (n = 260); 35-44 yrs (n = 21); 45-54 yrs (n = 143); 55-64 yrs (n = 9); 65+ yrs (n = 21).

proportion of ever smokers (34.0%), current smokers (28.1%) and daily smokers (25.7%) was significantly lower than older age groups. Among women, the proportion of never smokers exceeded 90% in all age groups except for those aged 65 years and older where it was 100% (Table 2).

Regarding the type of tobacco used, all current smokers were smoking manufactured cigarettes. In addition, 6.6% ( $n = 38$ ) of them were water pipe (*hookah*) smokers, all of them men. Only one person was using snuffed tobacco (*neshouk*) in addition to manufactured cigarettes. No other type of tobacco was used in the surveyed population.

After adjusting for the amount of tobacco consumed in *hookah*, Table 3 reveals that the mean number of cigarettes consumed per day, by both daily and occasional smokers combined, was 23.19. The mean number of cigarettes smoked by women (12.85) was significantly lower than that smoked by men (23.45). The same sex difference was observed among daily and occasional smokers.

Current smokers initiated the habit at a mean age of 18.21 years (ranging from 10 years up to 36 years) (Table 3). The mean age of tobacco initiation was comparable for daily (18.16 years) and occasional smokers (18.89 years). The mean age of initiation of tobacco use among women (22.64 years) was higher than that of men (18.10 years) but the difference was not statistically significant. Among daily smokers, women started smoking significantly later (mean age 24.09 years) than men (mean 18.04 years) whereas for

Table 3 Cigarette consumption, age of initiation and duration of tobacco use for different types of smokers by sex

Tobacco use and sex	No. of cigarettes per day <sup>a</sup>		Age of initiation (years)		Duration of smoking (years)	
	Mean $\pm$ s	Median	Mean $\pm$ s	Min-max	Mean $\pm$ s	Min-max
<b>Current smokers</b>						
Men <sup>a</sup>	23.45 $\pm$ 12.51	20	18.10 $\pm$ 3.83	10-36	21.20 $\pm$ 12.87	1-50
Women <sup>a</sup>	12.85 $\pm$ 8.81	20	22.64 $\pm$ 8.38	10-35	15.35 $\pm$ 11.52	2-39
Total <sup>a</sup>	23.19 $\pm$ 12.53	20	18.21 $\pm$ 4.04	10-36	21.06 $\pm$ 12.86	1-50
<b>Daily smokers</b>						
Men <sup>a</sup>	24.32 $\pm$ 11.99	20	18.04 $\pm$ 3.79	10-36	21.21 $\pm$ 12.73	1-50
Women <sup>a</sup>	15.81 $\pm$ 7.45	20	24.09 $\pm$ 8.50	10-35	16.27 $\pm$ 12.45	2-39
Total <sup>a</sup>	24.15 $\pm$ 11.97	20	18.16 $\pm$ 4.01	10-36	21.11 $\pm$ 12.74	1-50
<b>Occasional smokers</b>						
Men <sup>a</sup>	9.85 $\pm$ 12.69	2.8	19.02 $\pm$ 4.37	12-33	21.05 $\pm$ 15.00	1-47
Women <sup>a</sup>	2.01 $\pm$ 1.37	2.8	17.33 $\pm$ 6.42	10-22	12.00 $\pm$ 8.18	5-21
Total <sup>a</sup>	9.21 $\pm$ 12.34	2.8	18.89 $\pm$ 4.47	10-33	20.32 $\pm$ 14.70	1-47

<sup>a</sup>See Table 1 for number of interviewees.

<sup>b</sup>Number of cigarettes adjusted for hookah smokers.

the 3 women occasional smokers they started earlier (not statistically significant).

The mean age of initiation of tobacco use was studied in successive birth cohorts classified at 10-year intervals. The mean age of initiation of tobacco use was significantly lower in the age group 15–25 years (16.06), whereas it was significantly higher among those aged 65 years and older (23.22). On the other hand, between the ages of 25 and 64 years, tobacco use was initiated at similar ages (Table 4).

Current smokers continued tobacco use for an average duration of 21.06 years (Table 3). No significant difference was observed between daily and occasional smokers in this respect. The mean duration of tobacco use was longer among men (21.20 years) than women (15.35 years) but the difference was not statistically significant. Similar findings were observed among men and women who were daily and occasional smokers. The age of initiation and duration of tobacco use did not vary with number of cigarettes consumed per day (Table 5).

Among current daily smokers, 9.6% reported taking the first cigarette of the day less than 5 minutes after waking up, 5.9% between 5–30 minutes of awakening,

54.3% between 30–60 minutes and 30.2% after 60 minutes.

From the number of cigarettes smoked per day reported by current smokers, the total monthly expenditure on tobacco at the time of the study was estimated at about 40 000 LE, which represented 23.1% of the monthly income of these families (Table 6).

## Discussion

The reported prevalence of current smokers in the surveyed population was 27.2%. This figure should be considered approximate in view of the likelihood of under-reporting, particularly by women and children [4] since smoking status was determined by interview without any biochemical validation. Comparisons with other studies need to consider variations in the methods used and the populations surveyed, as some surveys include only those above the age of 18 years [4]. Furthermore, smoking status was only reported for daily smokers while other studies have included occasional smokers as well [1]. We judge that participants in the study adequately reflected the state of tobacco use for all household inhabitants as the preva-

Table 4 Age of initiation and duration of tobacco use for current smokers by age

Current age (years)	Age of initiation (years)		
	Mean $\pm$ s	Min–max	95% CI
15–24 (n = 88)	16.06 $\pm$ 2.87	10–21	15.46 to 16.67
25–34 (n = 127)	18.37 $\pm$ 3.54	10–30	17.74 to 18.99
35–44 (n = 147)	18.48 $\pm$ 4.24	10–32	17.79 to 19.17
45–54 (n = 139)	18.15 $\pm$ 3.43	10–30	17.57 to 18.72
55–65 (n = 54)	18.72 $\pm$ 4.99	10–35	17.35 to 20.08
65+ (n = 22)	23.22 $\pm$ 5.21	16–36	20.91 to 25.30

n = total number of interviewees.

Table 5 Age of Initiation and duration of tobacco use for different types of smokers by number of cigarettes consumed per day

Tobacco use and number of cigarettes per day*	Age of initiation (years)			Duration of use (years)		
	Mean $\pm$ s	Min-max	95% CI	Mean $\pm$ s	Min-max	95% CI
<b>Current smokers</b>						
< 10	(n = 96) 18.43 $\pm$ 4.49	10-35	17.44 to 19.43	(n = 96) 22.26 $\pm$ 13.66	1-50	19.49 to 25.02
10-20	(n = 310) 18.09 $\pm$ 3.96	10-36	17.64 to 18.53	(n = 310) 20.17 $\pm$ 12.95	1-50	18.72 to 21.62
> 20	(n = 171) 18.31 $\pm$ 3.67	10-30	17.75 to 18.86	(n = 171) 21.99 $\pm$ 12.17	1-49	20.15 to 23.83
<b>Daily smokers</b>						
< 10	(n = 70) 18.21 $\pm$ 4.97	10-35	17.02 to 19.41	(n = 70) 22.92 $\pm$ 13.59	1-50	19.68 to 26.17
10-20	(n = 304) 18.08 $\pm$ 3.96	10-36	17.63 to 18.53	(n = 304) 20.21 $\pm$ 12.92	1-50	18.75 to 21.67
> 20	(n = 166) 18.30 $\pm$ 3.68	10-30	17.74 to 18.86	(n = 166) 21.98 $\pm$ 11.95	1-49	20.15 to 23.81
<b>Occasional smokers</b>						
< 10	(n = 26) 19.03 $\pm$ 4.72	10-33	17.12 to 20.94	(n = 26) 20.46 $\pm$ 13.97	2-45	14.81 to 26.10
10-20	(n = 6) 18.50 $\pm$ 4.27	12-24	14.01 to 22.98	(n = 6) 18.00 $\pm$ 15.62	1-43	1.61 to 35.39
> 20	(n = 5) 18.60 $\pm$ 4.16	14-25	13.43 to 23.76	(n = 5) 22.40 $\pm$ 20.19	1-47	2.67 to 47.47

\*Number of cigarettes adjusted for hookah smokers.  
n = total number of interviewees.

lence rate obtained from participant interviews was very similar to that reported for the household population.

The prevalence of smoking among men in the present survey was 48.5%, a rate close to the global estimate of 47% and almost identical to the 48% reported for developing countries [1]. However, it is higher than the rate of 35% reported by the WHO Regional Office for the Eastern Mediterranean [4]. Comparing the rate of smoking among men with that of seven other Arab Muslim states, it appears that the population of Alexandria ranks fifth highest. The prevalence of smoking among men is higher than that reported from Bahrain, Iraq and Morocco, which ranges from 35% to 40%, but lower than that reported from Jordan, Tunisia, Saudi Arabia and Kuwait, which ranges from 52% to 60% [4]. The current high rate of smoking among men in the city of Alexandria is of concern, especially as it suggests a continuous increase in smoking prevalence in Egypt overall, as it is higher than the 39.8% reported from Cairo in 1982 [9] and the 40% estimated rate in 1999 [12].

The profile for women was very different from men, as only 1.5% reported being current smokers. This rate is slightly higher than the 1.0% reported in Cairo in 1982 [9]. Such a rate is the lowest reported in countries in the Eastern Mediterranean region [4] and is lower than for women in other developing countries (range from 2% to 10%) [13]. We should not be complacent about the low rate of smoking among women, as it is more likely to reflect social traditions



**Table 6 Expenditure on tobacco by current smokers as a percentage of family income**

Variable	Amount
Number of current smokers	577
Number of families to which current smokers belong	507
Mean monthly income of smokers' families (LE)	173.97
Total number of cigarettes smoked per month	401 520
Total number of packets smoked per month <sup>a</sup>	20 076
Total monthly expenditure on tobacco (LE) <sup>a</sup>	40 152
% of monthly family income spent on tobacco	23.1

<sup>a</sup>Monthly expenditure based on 2 LE for a packet of 20 cigarettes.  
1 LE = 0.29 dollars at the time of the study.

and women's low economic resources rather than health awareness [14]. The prevalence of smoking among women in Egypt, as elsewhere in the developing world, is expected to increase in view of the weakening of cultural norms [13], women's increased spending power and the tactics of the tobacco company in targeting women as new consumers [15].

The finding that there were no differences in the demographic characteristics of households with and without smokers implies a homogeneous distribution of smoking across all social strata and indicates that Alexandria is currently passing through the second stage of the smoking epidemic. In the first stage, smoking is unusual and mainly a habit of higher socioeconomic groups. In the second stage, smoking becomes increasingly common and peaks at 50% to 80% among men and tends to be spread equally across socioeconomic groups. Women's patterns usually lag 10 to 20 years behind those of men. In the third stage, women reach their peak rate around 35% to 45%, along with a decline in the rate among men to 40%. By the end of this stage, the rates among women will start to

decline. The slow but continuous decline of the prevalence rate among men and women, until smoking becomes a habit of the lower socioeconomic groups, is a demarcation of the fourth stage of the epidemic [6]. However, these stages, based on the experience in industrialized countries of the United States and Western Europe, may not be duplicated in developing countries.

There is a great public concern about the extent of current smoking and the hazards to which smokers expose themselves. This is magnified further if we take account of the other 72.8% of the population who are at risk because of their passive exposure to smoke in the environment.

WHO guidelines for tobacco surveys recommend that current smokers should be classified into daily or occasional smokers, and reported separately for both men and women and in different age groups, in order to draw reliable conclusions [4]. However, in our survey this is difficult for women who are current smokers because of their very small number.

Among men, the proportion of ever-smokers peaked in the age group 45–54 years and the second highest figure was

among the age group 35–44 years. This profile resembles that reported from Egypt by Omar et al., where the peak was between 40 and 60 years of age [16]. These two peaks may reflect the circumstances of earlier generations, who established their smoking habit 25 to 34 years ago during the beginning of the smoking epidemic in developing countries when scarce data were available to the public about the harmful consequences of tobacco [2,17].

Occasional smoking, which is a long-term pattern among some of the current smokers, is practised by less than 5% of most populations and the present survey is no exception; only 2.9% of the men were occasional smokers [18]. The prevalence rates of occasional smoking in different age groups show that the highest two values are in the oldest two age groups. We cannot judge whether the high proportion of occasional smokers among the oldest age groups reflects a long-standing behaviour or attempts at reducing tobacco consumption.

Prevalence of tobacco use is the net product of the two opposing processes of initiation and cessation. In any population, greater health awareness leads to increases in the utilization of curative services before preventive ones. Thus cessation rates are likely to increase before the rates of initiation decrease. In the present survey, the proportion of ex-smokers was low and fluctuated across different age groups without a clear pattern. However, it is important to note that the highest two rates were in the age groups 25–34 years and 55–60 years. It is possible that those between the age group of 25–34 years have started to realize the consequences of the bad habit and decided to quit, whereas those in the age group 55–60 years have been forced to do so because of the effects of smoking on their health.

We expected to observe the highest percentage of never smokers, with the lowest proportions of ever and current smokers, in the youngest age group 15–24 years, because it is in this age interval that young people start to take up and establish the habit. Intervention programmes should give the highest priority to this age group and equip them with the skills of resilience to avoid starting smoking.

The mean age of initiation at about 18 years among current smokers is in accordance with the global estimates [3,13]. Relevant studies have documented that the age of smoking initiation has dropped over the past four decades [19,20]. This can be seen among our youngest cohort of current smokers, as the age at which they initiated the habit (16 years) was lower than other groups. This was in agreement with an Egyptian survey conducted in 1990, which reported an age of smoking initiation between 12 to 16 years among a nationwide representative sample of secondary school-boys [21]. It has been revealed that initiation between 14 and 17 years carries a higher chance of nicotine dependence than initiation either before or after that age [22]. Unfortunately, this places the smokers from our survey in the most vulnerable group.

Previous research suggested that early smoking initiation predicts longer duration of smoking, heavier daily consumption, and increased chances of nicotine dependence [23,24]. This was not the case in the present research as the age of initiation, as well as the duration of tobacco use, were not significantly associated either with the number of cigarettes smoked, or the fact of being a daily or occasional smoker. Moreover, the majority of our daily smokers fell in the lowest categories of nicotine dependence.

With a daily average of 23 cigarettes, tobacco consumption among smokers in this study is far higher than the 13 cigarettes reported for the Eastern Mediterranean region [4] and the 14 cigarettes for less developed countries. Moreover, it is even higher than an average of 22 cigarettes tabulated for more developed countries. In 1997, WHO forecast a narrowing of the gap in cigarette consumption between developed and developing countries [4]. With such heavy consumption, it is not surprising that families with a smoker spent 23% of their income on tobacco. This is a low estimate, based on the low prices of local brands of cigarettes: foreign brands are more expensive. It clear, however, that many poor families spend a major proportion of their household income on tobacco instead of food and other useful items. In addition, these families may need to spend even larger sums on treating tobacco-related ailments.

The findings indicate that tobacco use in Egypt is high and concerted efforts are needed to curb the epidemic. All community sectors, health professionals, govern-

mental and non-governmental agencies should be mobilized to tackle the problem. Activities that should be carried out concomitantly include: public health education, avoiding role models for tobacco use in the media, strengthening legislation (to enforce compliance with non-smoking areas and limiting tobacco sales to minors) and increasing taxation with the purpose of encouraging cessation and preventing initiation. The youngest age groups, and women, should be the target for the latter measures to ensure that they will remain tobacco-free. Increasing the burden of taxation will have a positive impact on young people, as they are more sensitive to tobacco prices than adults [13]. Further research is needed to determine the predictors of cessation and, more importantly, the factors that prevent initiation by young people.

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