Prevalence of tobacco use among the adult Lebanese population

R. Baddoura [1] and C. Wehbeh-Chidiac [2]

معدل انتشار التدخين بين البالغين من سكان لبنان

رفيق بدورة وكارول وهبه – شدياق

الخلاصة: تم عشوائياً اختيار 727 شخصاً ممن بلغوا التاسعة عشرة أو تجاوزوها لتحديد معدل انتشار التدخين في لبنان، في إطار دراسة تستخدم فيها استبيانات إميل رو وفاغرستروم. وتم تعريف المدخّنين على أنهم كل من يجيب بكلمة نعم على السؤال القائل «هل تدخن حالياً؟». وقد اعتبر إحراز 6 درجات فأكثر، بحسب ما حدّده فاغرستروم، دليلاً على شدة إدمان النيكوتين. وتبيَّن من الاستبيان أن معدل انتشار التدخين قد بلغ 53.6%. وكانت نسبة المدخّنين إلى المدخّنات 1.23%، وتم تصنيف 67% من المدخّنين كمدمنين. وكان سبب الفشل في الإقلاع عن التدخين مرتبطاً بأعراض الامتناع، وعلى رأسها التهيُّجية (57%) وزيادة الوزن (20%). وقد ذُيِّلت الدراسة بتوصيات لمكافحة المعدلات المرتفعة للتدخين.

ABSTRACT To determine the prevalence of smoking in Lebanon, 727 individuals aged ≥ 19 years were randomly selected for study using Emile Roux and Fagerstrom questionnaires. Smokers were defined as those answering "yes" to the question, "Do you currently smoke?" A Fagerstrom score ≥ 6 indicated strong nicotine addiction. The prevalence of smoking was 53.6%. The male/female ratio was 1.23, with 67.0% of smokers categorized as addicted. Failure to quit was related to withdrawal symptoms, mostly irritability (57%) and weight gain (20%). Recommendations are given for combating this high prevalence of tobacco use.

Prévalence de l'usage du tabac dans la population adulte libanaise

RESUME Afin de déterminer la prévalence du tabagisme au Liban, 727 personnes d'âge ≥ 19 ans ont été choisies au hasard pour l'étude en utilisant le questionnaire Emile Roux et le questionnaire de dépendance de Fagerström. Les fumeurs étaient définis comme ceux ayant répondu « oui » à la question « Fumez-vous actuellement ? ». Un score ≥ 6 au questionnaire de Fagerström indiquait une forte dépendance à l'égard de la nicotine. La prévalence du tabagisme était de 53,6 %. Le rapport hommes/femmes était de 1,23, 67,0 % des fumeurs étant classés dans la catégorie des dépendants. L'échec de l'arrêt du tabagisme était lié aux symptômes du sevrage, principalement l'irritabilité (57 %) et le gain de poids (20 %). Des recommandations sont données pour lutter contre cette forte prévalence de l'usage du tabac.

[1]*Epidemiological Unit, Department of Rheumatology;* [2]*Department of Family Medicine, Faculty of Medicine, Saint-Joseph University, Beirut, Lebanon.*
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Introduction

Although cigarette consumption in the United States of America (USA) in the years 1986–1997 decreased by 17%, production of tobacco products in the USA during the period increased by 400%, with exports to other countries taking up the increased output. Particularly in countries of the developing world, consumption of tobacco products has increased as countries have absorbed the US export-led production. Given the power of the vested interests in maintaining this situation, multilateral arrangements aimed at controlling the epidemic of cigarette smoking are unlikely to be put in place and acted on any time soon [*1*]. Smuggling of tobacco products has come to play an increasingly significant role in the international tobacco trade, particularly in areas of the world suffering ongoing war and armed conflict. The increased tobacco consumption in developing countries experiencing demographic transition is likely to have an extremely negative impact on the health and well-being of the population of those countries. To reduce this impact, the World Health Organization has strengthened noncommunicable disease control and prevention in the developing regions, particularly in the Middle East.

Although data on smoking in Lebanon are limited, the magnitude of the problem is obviously great. Lebanon ranks fourth in the world in terms of the consumption of American cigarette brands, and nineteenth in terms of overall cigarette consumption [*2*]. In Lebanon, anti-smoking legislation is effectively non-existent. The trading and advertising of tobacco products constitute a significant part of the Lebanese economy. Tobacco advertising is completely unrestricted. The country's mass media organizations are affiliated to the different political parties and they derive substantial revenues from tobacco and alcohol advertising. Many political leaders and social figures smoke during television interviews. Schools are rarely involved in educational programmes aimed at smoking prevention and control. Schools are not smoke-free areas, and most hospitals are still not smoke-free areas. Public campaigns on smoking-related health hazards remain limited to a single one-day activity throughout the year. Fieldwork is essentially carried out by nongovernmental organizations, which lack adequate support. The medical community is poorly committed to smoking prevention and awareness policies. Medical curricula do not include the community dimension of tobacco-related diseases. A review of the medical literature reveals that only a few studies on smoking in Lebanon have been carried out, most of which relate to specific categories of the population, such as patient groups or small social and professional groups [*3–8*]. Our survey aimed to assess the pattern of tobacco use in the Lebanese adult population: in particular, the prevalence of smoking, nicotine addiction and the quit ratio (QR).

Methods

In 1997, we surveyed a sample of the Lebanese population aged ≥ 19 years, with 825 individuals randomly selected using a multilevel cluster sampling technique stratified by district. All individuals in the sample were asked to respond to a series of questions in a face-to-face interview, which was conducted by a trained team of young people of both sexes under the supervision of a private sector specialist survey management organization, IPSOS-STAT. The survey comprised four parts. The first part related to questions designed to elicit sociodemographic variables. The second related

to smoking behaviour, for which an Emile Roux questionnaire was used. The third part was designed to determine a Fagerstrom score for nicotine addiction, and the fourth part used the Hamilton scale for anxiety and depression (HAD).

The sociodemographic variables elicited included age, sex, marital status, education and profession. Smokers were defined as those who answered "yes" to the question "Do you currently smoke?" Ever-smokers, among the non-smokers, were those who answered "yes" to the question, "Have you ever smoked before?", and non-smokers were those who answered "no" to both questions.

Smoking behaviour was described with respect to the following:

- circumstances of onset;
- duration of smoking;
- preferred time and place for smoking;
- factors inducing positive reinforcement (including: mental, e.g. the ability to cope with stress or to concentrate; and physical, e.g. the smell and taste of tobacco);
- factors inducing negative reinforcement (e.g. experiencing loss of memory, cough, expectoration).

Smoking behaviour was also described relative to the attitudes of respondents to the smoking habits of others, distinguishing between those who encouraged others to smoke, those who did not seek to influence the smoking behaviour of others and those who forbade others to smoke.

The intensity of smoking was measured by the quantity of tobacco smoked per day, whether in the form of cigarettes, cigars, cigarillos, pipe tobacco or hookah (*shisha*).

Nicotine addiction was measured using the Fagerstrom scale, which includes the following items:

- number of cigarettes per day;
- nicotine content, defined as regular, light and ultralight;
- inhaling or not inhaling tobacco smoke;
- smoking more in the morning or more in the afternoon;
- whether or not the preferred cigarette is early in the morning;
- the ability to abstain from smoking where forbidden, or while ill.

Each of the questions in this part of the survey were closed-end answer-type questions, with answers rated 0, 1, or 2, according to the associated level of addiction. The ratings were totalled to provide the respondent's Fagerstrom score, for which a value ≥ 6 is equivalent to the presence of significant nicotine addiction and ≥ 8, to strong addiction.

Similarly for depression and anxiety-related symptoms, a score was calculated by summing the values obtained from answers to the HAD questionnaire, these being rated from 0 to 3, according to the associated level of depression or anxiety. A threshold of 12 is recommended for anxiety items and a threshold of 8 for depression items.

Statistical analysis included the chi-squared test for qualitative variables and an analysis of variance (ANOVA) for quantitative variables. A significance level of $P < 0.05$ was used.

Results

Prevalence of smoking

Our sample included 825 individuals, 727 of whom agreed to be surveyed (88% response rate). The mean age was 40.1 years [confidence interval (CI): 39.0–41.2], and the male/female ratio 0.95 Prevalence of smokers (Figure 1) was 53.6% (CI: 50.0–57.2). A greater percentage of smokers were male (male: 60.7% versus female: 46.9%, $P = 0.00018$), giving a male smok-

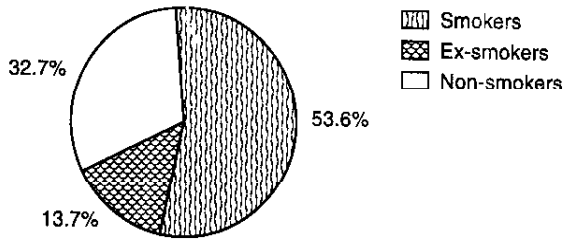

Figure 1 **Prevalence of smoking in the adult Lebanese population**

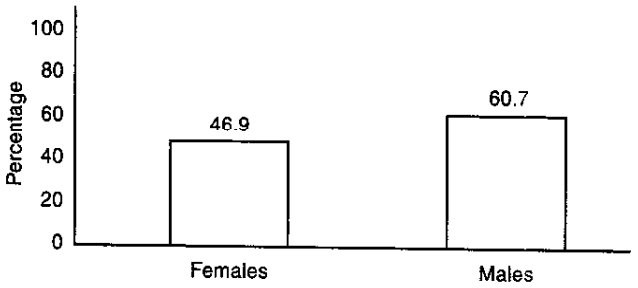

Figure 2 **Prevalence of smoking by sex in the adult Lebanese population**

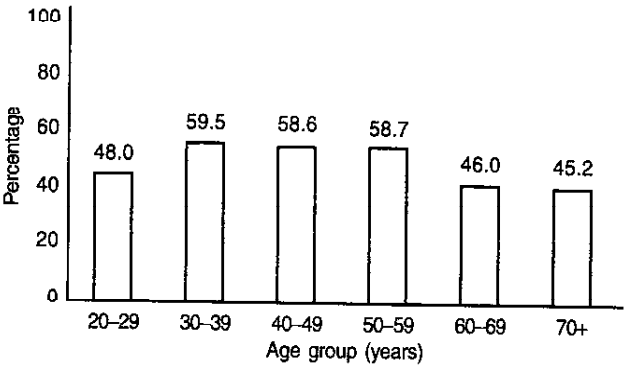

Figure 3 **Prevalence of smoking by age in the adult Lebanese population**

er/female smoker ratio of 1.23 (Figure 2). Our study showed prevalence varying with age (Figure 3). The highest prevalence (59.5%) was among 30–39-year-olds, an age group constituting 31.5% of the general population. The prevalence of ex-smokers was 13.7% (CI: 11.0–16.2).

Smoking behaviour

The mean age at starting smoking was 19.7 years (CI: 19.3–20.3), with a range of 10–50 years; 90% had started before age 25 years. The average duration of smoking was approximately 20.4 years (CI: 19.0–21.8). Among ex-smokers, the average duration of smoking was approximately 14 years, and average duration of quitting was approximately 10 years. Cigarettes were the most common form of tobacco consumption, reported by 94.9% of participants. Among all types of cigarettes, filter cigarettes were the most widely smoked (95%), although most were brands containing high tar and nicotine levels. Other forms of tobacco consumption included *shisha* (14.6% of respondents), cigars (1.5%), pipe tobacco (1.3%) and cigarillos (0.5%). Of those who smoked the *shisha*, 63.2% did so daily, with half of this group smoking more than two pipes per day.

The average number or cigarettes smoked per day was 23.3 (CI: 21.7–24.9), although 20% smoked ≥ 40 cigarettes/day, 67.4% smoked ≥ 20 cigarettes/day, 15.9% smoked 6–19 cigarettes/day, and 10.8% smoked ≤ 5 cigarettes/day. The daily number of cigarettes smoked also varied by sex and professional status — males smoked 27.4 cigarettes/day and females 18.3 cigarettes/day ($P < 0.000001$); teachers smoked the least (16.8 cigarettes/day) and the unemployed the most (34.8 cigarettes/day) ($P = 0.000001$). Interestingly, there was no significant difference in daily consumption when analysed by level of education.

Positive reinforcement of smoking was reported by respondents to be more of a mental than a physical experience, with 55.9% reporting that they felt more able to concentrate when smoking, 82.3% reported obtaining relief from stress and 52.1% attributed increased alertness to their smoking. Only 18.6% reported that their smoking was positively reinforced by being able to manipulate a cigarette in their hands, while 44.7% said they appreciated the taste and 68.7% the smell of tobacco. Negative reinforcement of smoking was considered to be more physical than mental, with 43.3% reporting cough, 29.0% expectoration and 40.2% bad breath, as negative reinforcements; 12.0% reported memory troubles, 27.0% feelings of decadence and 46.0% feelings of guilt.

Tobacco addiction

The level of nicotine addiction, using the Fagerstrom score, averaged 6.4 (CI: 6.2–6.6) among all smokers, with 67.0% (CI: 62.24–71.76), scoring ≥ 6 and 32.4% (CI: 27.66–37.14) scoring ≥ 8. There was a statistically significant difference between the average score for males (6.8) and females (5.8) ($P < 0.0001$). However the Fagerstrom score did not correlate with age.

Quitting

The observed QR was 0.25, with an insignificant difference between males (0.23) and females (0.28) ($P = 0.05$). The QR increased significantly with age ($P = 0.002$), and varied by level of education and professional status. The average QR among individuals with a university level of education was 0.44, while among the unemployed it dropped to 0.05.

The ill-health effects of tobacco were reported as the reason for considering quit-

ting by 83.5% of the sample. Principal reasons quoted were cancer (65.8%), myocardial infarction (63.6%), bronchial disease (66.2%) and premature ageing (51.5%). Only 45.4% of women quoted tobacco's harmful effects on pregnancy. Medical counselling was reported by 43.3% and social influence by 40.7%. Feelings of being a prisoner of tobacco as a consequence of addiction were often a motivation to consider quitting. Proving oneself was reported by 64.5% of individuals.

Quitting smoking was frequently associated with withdrawal symptoms such as irritability and weight gain, reported by 57% and 20% of the participants respectively. Approximately 50% of the sample reported these reasons as being the reason for not quitting. Other reasons given were social or economic difficulties (17%) and a culture and environment in which tobacco products are widely promoted and accepted, readily available and frequently offered (13%).

Discussion

Our study revealed a smoking prevalence in the adult population in Lebanon of 53.6%. The percentage of ex-smokers was estimated to be 13.7%. By contrast, the reported prevalence of smoking in the USA in 1992 was 25.6% [*9*], and has continued to decline since that year, emphasizing just how unacceptable is the Lebanese prevalence. It is interesting to note that the prevalence of smoking among Lebanese immigrants living in the Detroit area is higher than that for the US population overall [*2*], although the prevalence among all inhabitants of the Detroit area may also be higher than the overall US prevalence. The prevalence of smoking in Lebanon is also higher than in western European countries. In France, the reported prevalence in 1992 was 40% [*10*], with a subsequently decreasing trend greatly accelerated after 1993 as a result of legislative restrictions on tobacco advertising. At the time of our study, the prevalence of smoking in western Europe overall was 33.1% among men and 29.0% among women [*11*].

Our study showed smoking prevalence in our population varying with age, with the highest prevalence among the 30–40 years age group. This is similar to what has been reported in the literature [*10*]. The proportion of smokers decreased progressively after the age of 60 years, not necessarily because people quit smoking by that age, but more likely because many fewer smokers live to that age than do non-smokers. The decrease seen in our sample is less than that observed in France, and is considerably delayed in comparison to the USA, where the proportion starts to decline around the age of 45 years [*10,12*]. By comparison, the results obtained in our study are similar to those obtained from other developing countries in the early eighties: China 56% (1981 figures); Egypt 40% (1982); India 61% (1985); Indonesia 61% (1984); and Tunisia 58% (1984) [*1*]. However, the ratio of male to female smokers in our sample more closely resembles that of the industrialized world [*13*].

The average age at starting smoking in our study was 19.7 years, with 90% of smokers starting smoking before the age of 20 years. In Western countries, the age at starting smoking is between 11 and 15 years, which not unexpectedly, is lower than what we observed (everyone aged < 19 years was excluded from our study) [*14–16*].

Intensity of smoking was also comparatively high in our population. The average daily number of cigarettes smoked daily was 23, compared to 15 in France, with 67.4% of our sample smoking > 20 ciga-

rettes/day compared to 27% in the USA [*12*]. The figure for those smoking < 5 cigarettes/day (10.8% in our sample) is similar to that for the USA [*17*].

The average number of years of smoking in our sample was 20.4 years. *Shisha*, a particularity of oriental populations, is relatively common in Lebanon. In our sample, the percentage of individuals who reported smoking the *shisha* was 14.6%, two-thirds of whom were regular *shisha* smokers. This proportion is important since it has been shown that the urine cotinine level after two *shisha* is equivalent to that after 30 cigarettes [*18*].

The number of addicted individuals in our study was very high, with 67.0% of smokers having a Fagerstrom score ≥ 6, and approximately one-third with a "highly addicted" Fagerstrom score of ≥ 8.

Smoking in Lebanon is socially entrenched, with cigarettes commonly offered during many types of social occasions, both celebratory and sorrowful. Our study confirms the ready acceptance of smoking in our society, with 8.5% of smokers in our sample disposed to encourage others to smoke and 70% reporting that they like to offer and receive cigarettes. Furthermore, non-smokers in our sample were accepting of others' smoking habits. Of the smokers in our sample, 13% who sought to quit reported that they were often discouraged from doing so by the temptations and pressures of a culture and environment where tobacco products are widely promoted and accepted, readily available and frequently offered.

Passive smoking in the general population is frequent. Non-smokers reported being exposed to a smoking environment in 93.7% of cases. One Iranian study assessing passive smoking among pregnant women reported that 39.75% were exposed to passive smoking [*19*], suggesting that passive smoking in developing countries deserves far greater attention than it has been given up to now.

Willingness to quit was reported by 59.2% of smokers in our sample, a figure which compares poorly with the USA and Western Europe, where information on the health hazards of tobacco consumption is widely disseminated [*20,21*]. In the USA, the proportion of women expressing their intention to quit in 1993 was estimated at 73% [*22*]. The QR there increased between 1965 and 1987 from 0.029 to 0.45 among both males and females (more among adults than teenagers), and thus contributed to the observed decrease in smoking prevalence among adults in that country [*23*]. The positive effect on quitting of knowing and being conscious of potential tobacco health hazards that we observed in our sample has been reported elsewhere in Europe [*14*]. The positive influence of environmental factors was reported by 40.7% of respondents in our study, and of medical counselling by 43.3%. Unfortunately, quitting remains a late event in smoking behaviour — the average number of years of smoking before quitting was approximately 19 years in our study, possibly because the ill-effects of smoking are often not readily apparent until a smoker is in his or her 40s and 50s.

It is relevant to note that medical intervention remains limited in Lebanon with regard to smoking prevention. Medical curricula are wanting in this regard, particularly as it has been shown that medical counselling increases the chances of an individual quitting (although it is insufficient by itself) [*25*].

Effective strategies to control and prevent smoking are essential to improving health outcomes of populations, particularly in countries where other factors predispose to less than optimal health, such as

poverty, poor nutrition, polluted cities, and diversion of resources to armed conflict. While the need is most urgent in countries defined by their lack of adequate resources, most of the anti-smoking initiatives are being taken by the wealthier countries to protect their own populations. For example, in June 1996, the Council of State and Territorial Epidemiologists in the USA agreed to add smoking to the list of reportable diseases to the Centers for Disease Control and Prevention, thereby requiring the involvement of health professionals in anti-smoking public health policies [*26*]. The World Health Organization's noncommunicable disease prevention and control programmes in developing countries are likely to boost community involvement — an important prerequisite for effective prevention and control of tobacco consumption. Prospective surveys are contemplated to measure the effectiveness of potential public health interventions [*27*]. The global burden of disease initiative can also trigger additional public health awareness of the negative impact on health of tobacco consumption [*28*].

Recommendations

Based on the results of our study, the following actions are needed in Lebanon to combat tobacco use.

- Promote sustainable prevention programmes to control the tobacco epidemic by targeting adolescents in schools and health professionals in health care facilities and medical faculties. Occupational health could be addressed from the perspective of the ill effects of direct and passive tobacco smoking.
- Enact and implement legislation to restrict tobacco advertising in electronic and print media and in public places, and to promote smoke-free areas and smoke-free television programmes.
- Create the necessary primary health care facilities supporting people who are considering quitting smoking. Such facilities would operate in collaboration with secondary care facilities.
- Plan and implement prospective surveys to assess the effectiveness of the implementation of the above-mentioned activities, to be carried out by academic institutions, in concert with the national policies aimed at preventing and controlling noncommunicable diseases, of which tobacco is a prominent risk factor.

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Developing countries to receive US$17 million for tobacco control research

Tobacco control in developing countries will soon receive a US$ 17 million boost from a new programme co-sponsored by the US National Institutes for Health (NIH) and the World Health Organization (WHO). The International Tobacco Health Research and Capacity Building Programme will, over the next five years, support research on tobacco consumption and related health risks in developing countries and resolve some unanswered questions about how tobacco impacts low- and middle-income countries in particular. Besides providing a better understanding of the tobacco burden, the programme will build up the institutional and personnel capacity of developing countries in tackling the tobacco epidemic.

Source. WHO Press release WHO/29
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