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## Cervical cancer screening visit as an occasion for counseling female smokers to quit

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### ABSTRACT

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**Aims and background.** In the last decades in Italy, a smaller decrease in smoking among women than in men has been observed and a younger age at start in young women. Nevertheless, gender-specific strategies for smoking cessation have rarely been developed, except those for pregnant women. A study was conducted to evaluate the feasibility of carrying out an intervention of primary prevention by counseling for smoking cessation the female smokers attending cervical cancer screening programs in Florence, Italy.

**Methods.** All female smokers attending the services for cervical cancer prevention at the Cancer Prevention and Research Institute in Florence, Italy, between March 2004 and January 2005, who volunteered to participate in the study, received a brief motivational stage-matched counseling for smoking cessation and a face to face interview at enrollment and after 6 and 12 months. The counseling was evaluated by comparing quit rates, changes in smoking intensity, and motivation to quit at the first and second follow-up periods to the same data collected at enrollment. Multivariate logistic regression analysis was performed to estimate the influence on smoking cessation of demographic characteristics, smoking habit and attitude to quit.

**Results.** 177 women participated in the study. After 1 year, a quit rate of 12.4% (95% CI, 7.5-17.3) was observed. Among those who never quit, there was a 39.3% reduction in the average daily cigarette consumption and a 51.9% reduction in smoking the first cigarette of the day immediately on awaking or just after breakfast.

**Conclusions.** The results and the opportunity to contact a large number of female smokers on the occasion of cervical cancer screening suggest the importance to evaluate the efficacy of the intervention of primary prevention in this health setting.

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### Introduction

Smoking is the leading cause of death of many diseases. Despite the female lower smoking prevalence and the usual later age at which women start, this conclusion is no less cogent for women than for men, and the debate about a greater susceptibility of female lung to tobacco carcinogens is ongoing<sup>1-4</sup>. Smoking is also a form of drug addiction and must be treated as a disease, as clearly stated by two consensus reports published in 2000<sup>5,6</sup>.

Since 1980, several sample-based surveys carried out by the Italian Institute of Statistics (ISTAT) showed a stall around 17.0% in female smoking prevalence from 1993 onwards and a younger age at start in young women, suggesting the need for gender-specific tobacco control strategies. ISTAT surveys recorded the highest prevalence in women among those aged 25-49 years (around 20-25% in 2009)<sup>7</sup>.

The smoking habit in both genders is strongly influenced by social pressures (at home, work or school) and also by individual factors such as awareness of the dam-

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age of smoking, religious faith, and attitudes or fears<sup>8</sup>. Furthermore, in the past, the tobacco industry implemented gender-specific strategies that were designed to induce the smoking habit in women<sup>9</sup>.

In the last decades, many programs aimed to reduce smokers have been implemented, especially in developed countries. Quitting guidelines have been produced in several countries, including Italy<sup>10</sup>, based on literature reviews<sup>5,11,12</sup>. Anyway, gender-specific strategies for smoking cessation have rarely been developed, except those for pregnant female smokers. Several health organizations have expressed alarm at the increase in female smoking prevalence and have called for gender-specific prevention strategies, as for example the WHO Framework Convention on Tobacco Control, which has been ratified in many countries<sup>13</sup>.

Quitting smoking can sometimes be very difficult without support, due to the central role of nicotine addiction in smoking. The most difficult task for smokers in becoming a non-smoker is maintaining abstinence rather than quitting<sup>14</sup>. In women, several factors have been suggested as being influential in counteracting smoking cessation efforts<sup>8</sup>: physiological factors such as the higher tolerance or sensitivity to nicotine and the frequent withdrawal symptoms in relation to the hormonal monthly cycle; psychological factors such as fear of gaining weight and lack of self-confidence in one's ability to stop; and social factors such as living with a smoking partner.

Specific prevention strategies need to be implemented in order to help young female smokers to quit. Young women present spontaneous cessation rates lower than older female smokers, and they have a higher probability to be at risk of developing coronary health disease due to concurrent use of oral contraceptives<sup>9</sup>, or to represent a risk to their fetus or child<sup>9</sup>. Furthermore, squamous cell carcinoma of the cervix appears to increase in current smokers with the number of cigarettes smoked per day and with younger age at start<sup>15</sup>. Smoking is a cofactor of progression from HPV infection to cancer<sup>16-18</sup>. The estimated HPV prevalence is higher (between 27% and 46%) in women aged 15-25, whose smoking prevalence is also at a higher level (around 16% in 2009)<sup>19</sup>. A recent study observed a synergy between smoking and HPV-16 in cervical cancer *in situ* development, which may occur almost a decade before the cancer detection<sup>20</sup>.

For all these considerations, we developed and conducted an intervention study, with the aim of evaluating the feasibility of carrying out an intervention of smoking prevention on the occasion of cervical cancer screening programs, which in Italy are free of charge and very much attended.

## Material and methods

Between March 2004 and January 2005, female smokers attending the cervical cancer screening program in

Florence were contacted and invited to participate in an intervention study on smoking cessation. Women were contacted in two settings: an outpatient screening visit and a gynecological consultation. In the former setting, the contact was made as women departed from the screening unit after their tests, and in the latter, contact was made in the waiting room prior to the consultation. A female health assistant contacted all the women attending for the test or consultation in the two settings while standing in front of a poster on which the title and the aims of the study were reported. All women received a leaflet about quitting methods and the public health services for smoking cessation available in Tuscany. Information on smoking habit and attitude was collected for all smokers and included age at start, daily cigarette consumption, time of day they smoked their first cigarette (immediately on awaking, after breakfast, or later), number of former quitting efforts and motivation to quit. The smokers who volunteered to participate in the study (the participants) received a brief counseling session for smoking cessation by the health assistant. They were also asked to complete a questionnaire about their dependence level – the Fagerstrom Tolerance Questionnaire (FTQ) – and underwent a short interview for demographic data (age, educational level, occupation and marital status). The health assistant was trained in stage-matched counseling for smoking cessation and, during the enrollment phase, received the support of a psychologist (one of the authors: RT) for whatever problem she might have encountered.

The participants were followed at 6 and 12 months, at which times they were asked by the same health assistant to undergo a telephone survey regarding their current smoking habit, motivation to quit, and the quitting efforts made in the last half year. At the first and second follow-up periods, the assistant either reminded women of their decision to quit, strengthening them in their resolve, or encouraged them, as possible options to their current smoking habit, to consider quitting or reducing their consumption.

All participants signed an informed consent, which, along with the study design and materials, had been evaluated and approved by the Ethics Committee of the Public Health Administration of Florence, the participants' residential area.

Smoking intensity was categorized in terms of daily cigarette consumption ( $\leq 5$ , 6-10, 11-20,  $\geq 21$ ). Smoking dependence was measured using the results of the FTQ and the answer to the question regarding the time of day of the first cigarette. Quitting motivation was labeled using the levels of Prochaska's transtheoretical model, and, in particular, women were categorized as being in either the "pre-contemplation level" (they did not want to try to quit), the "contemplation level" (they wanted to try but not in the next month), or the "determination level" (they wanted to try immediately)<sup>21</sup>.

Socio-demographic information, smoking habit characteristics, and attitude and motivation to quit were self reported. The effect of the counseling intervention on participants was evaluated at the first and second follow-up periods by calculating the quit rates, changes in smoking intensity, and changes in motivation to quit at follow-up.

Non-parametric tests were used to estimate the associations between groups: the Wilcoxon matched-pairs signed-ranks test to assess the reduction of smoked cigarettes between different periods and the Wilcoxon rank sum test in unmatched samples (Mann-Whitney two-sample statistic) to estimate the burden of the reduction in different groups. The Kruskal-Wallis test and Cuzik test for trend were used to study smoking reduction by categorical variables, and the Pearson chi-squared test was used to determine the associations between quit rate and motivational level.

Multivariate logistic regression analysis was performed to estimate the influence on smoking cessation of demographic characteristics, smoking habit and attitude to quit. The statistical package STATA (8.2 version, 2005) was used for the analyses.

## Results

Of the 2,062 women contacted, 87.1% of the contacts were made on departure from an outpatients screening visit and 12.9% while waiting to enter the gynecological consulting room. Of the total, 562 women (27.3%) were smokers and 590 (28.6%) former smokers. Of the total smokers, 177 (31.5%) agreed to participate in the study. The participation rates in the two settings were similar: 8.3% among those attending the screening services and 9.7% the gynecological consulting rooms. Women from the latter group appeared younger and more educated,

but no significant differences in smoking-related variables were observed. Most of the women had a high educational level (72.9% had studied for at least 13 years), were aged 30-59 years ( $\leq 30$ , 11.3%; 30-59, 82.5%;  $\geq 60$ , 6.2%) and worked (72.3%). Compared to non-participating smokers, participants showed a greater daily cigarette consumption (the medians were 12 *vs* 7 in participating and non-participating smokers, respectively), a higher proportion smoking their first cigarette before or just after breakfast (71.7% *vs* 45.0%), and a higher proportion of quitting efforts (77.2% *vs* 40.1%). A summary of the smoking habit characteristics of participating and non-participating women is reported in Table 1. Most of the participants were motivated to quit (89.5% in the "determination level"; 95% CI, 83.9-93.6), declaring a median number of 2 quitting efforts (range, 1-6), and exhibiting a generally lower dependence level (76.8% with a light/medium score in FTQ; 95% CI, 70.6-83.0). Among them, as expected, 8 heavy smokers (those whose daily consumption exceeded 20 cigarettes) had a high tobacco-dependence level when considering either the time of day of their first cigarette or their FTQ results.

All participants were contacted at the 6-month follow-up. Three women were lost at one-year follow-up; they were considered as continuing smokers in the quit rate computation and were excluded from other outcome analyses at the second follow-up.

The 6-month quit rate was 17.0% (30 women quit, 95% CI, 11.5-22.5). Of them, 22 women remained abstinent at the one-year follow-up. Moreover, between the first and second follow-up, another 15 women stopped smoking. The one-year quit rate (12.4%; 95% CI, 7.5-17.3) was calculated considering only the 22 women who were abstinent at both interviews. None of the smoking behavior variables, adjusted by age, were significantly associated with quitting, as shown in Table 2,

**Table 1 - Smoking habit characteristics of respondent female smokers (n = 562) attending cervical cancer screening services in Florence, Italy, between March 2004 and January 2005**

Smoking habit characteristics	Participating women (n = 177)		Respondent women not participating (n = 385)	
	%	(95% CI)	%	(95% CI)
Daily cigarette consumption				
0-5	11.9	(7.5-17.6)	43.8	(38.7-48.9)
6-10	37.9	(30.9-45.4)	27.1	(22.7-31.8)
11-20	43.5	(36.1-51.1)	26.0	(21.7-30.7)
$\geq 21$	6.8	(3.6-11.5)	3.1	(1.6-5.4)
Time of day of first cigarette				
At awake	11.3	(7.0-16.9)	9.9	(7.1-13.4)
After breakfast	60.4	(52.8-67.7)	35.1	(30.3-40.1)
Later	28.2	(21.7-31.5)	55.0	(49.8-60.0)
Desire to quit	96.0	(92.0-98.4)	33.1	(28.4-38.0)
Former efforts made to quit	77.2	(70.4-83.2)	40.1	(35.2-45.2)
Motivational status				
Pre-contemplation	1.7	(0.4-5.0)	94.5	(91.8-96.6)
Contemplation	8.8	(5.0-14.1)	4.9	(3.0-11.0)
Determination	89.5	(83.9-93.6)	0.5	(0.1-1.9)

except for smokers who smoked 11-20 cigarettes a day, who were less likely to make a quit attempt than those who smoked 1-5 cigarettes a day (OR = 0.23; 95% CI, 0.06-0.92).

A significant decrease in cigarette consumption was found at both follow-up periods among the 129 participants who continued to smoke throughout the study. Their mean daily consumption dropped from 14.5 to 10.3 at the first follow-up and to 8.8 at the second follow-up. The reduction after 1 year was equal to 39.3%. The trend appears significantly associated with variables related to dependence level (FTQ, time of day for first cigarette) and to the daily consumption at enrollment (the Kruskal-Wallis test and trend test were statistically significant). Furthermore, the proportion of smokers who had their first cigarette before or just after breakfast decreased from 74.4% at initial contact to 50.4% and 51.9% at the first and second follow-up periods, respectively, with heavy smokers showing a greater decrease. However, among continuing smokers, a large decline was observed in motivational level as time passed from enrollment in the study. The decline was not associated with any variables. The percentage of women classified in the "determination level" fell from 86.8% at first contact to 36.4% and 3.9% at the first and second follow-up periods, respectively.

## Discussion

Individual motivational stage-matched counseling for smoking cessation is a well-defined and effective practice<sup>22-23</sup>. As smoking is a drug addiction and the most important risk factors for several diseases, prevention initiatives need to be wider spread and, as much as possible, to involve also health professionals who are not specifically devoted to smoking prevention activities as are those involved in cancer screening programs, the setting used in our study. For the type of intervention applied in this study, the screening setting could have been considered problematic because of the possible anxiety of women attending a practice aimed at the early diagnosis of cancer. However, it could have been considered quite facilitative assuming that the included women would be more willing to receive advice or counseling on their life styles<sup>24</sup>. In the present study, the anxiety levels were considered to be low because the women were only those attending an initial examination (and not those who had to undergo further medical examinations due to a positive Pap test result) and because Pap testing, a simple and quick test, is widespread and well accepted by women in Florence, as shown by the participation rate. For these reasons, the setting of cervical cancer screening programs represents an op-

**Table 2 - Association between quitting and demographic and smoking characteristics of study participants (177 female smokers attending cervical cancer screening services in Florence, Italy, between March 2004 and January 2005)**

Variable	No. of women		Total	OR <sup>a</sup>	95% CI
	who quit	who did not quit			
Age class, yr					
<35	4	37	41	1	-
35-49	17	50	67	3.42	0.71-16.47
≥50	19	50	69	3.31	0.69-15.90
Education, yr					
≤13	9	37	48	1	-
>13	30	99	129	2.14	0.67-6.85
Working					
No	15	34	49	1	-
Yes	25	102	128	0.42	0.16-1.11
Marital status					
Married	24	71	82	1	-
Not married	16	66	95	0.94	0.36-2.43
Daily cigarette consumption					
1-5	7	14	21	1	-
6-10	16	49	65	0.55	0.16-1.90
11-20	14	65	79	0.23	0.06-0.92
≥20	3	9	12	1.08	0.20-5.75
Former efforts to quit					
No	5	35	40	1	-
Yes	35	102	137	2.83	0.62-12.84
Motivational status					
Pre-contemplation & contemplation	6	19	25	1	-
Determination	34	118	152	1.22	0.26-5.77

<sup>a</sup> Odds ratio for all variables, except age class, adjusted by age class.

portunity for an intervention targeted to female smokers, whose needs to contact general practitioners or other health professionals are generally few.

There was a difference in the timing of the contacts in the two settings (prior to a gynecological consultation or after a screening test). This was necessary because the waiting time in the screening unit was known to be too short. The choice of just one assistant eliminated the variability that would have occurred if the contacts had been made by a team. Moreover, in order not to confuse women but rather to focus their complete attention on their smoking habit, particular care was taken to characterize the health assistant and her role in the study (she was located in front of a poster that explained her job). The choice of a female rather than a male assistant was also deliberate as most Italian's pre-conceptions of health visitors are that they are female, although more men are now taking up this kind of work.

The chosen approach was a stage-matched counseling, a motivational talk oriented to confront and resolve an ambivalence that is present when habit changes are under discussion<sup>25,26</sup>. It is aimed to help women progress even just one stage because it is known that this can increase the chances they will quit on their own in the near future<sup>27</sup>. Its main characteristics were expression of empathy, avoidance of controversy, bypassing but using the individual's resistance, working on emotional conflicts, and supporting self-esteem in all stages of change. The health assistant was specifically trained for this intervention study.

The prevalence of smokers in the study was greater than that registered by a national survey on female smoking prevalence undertaken in 2005 (27.3% and 22.1% in the present study and the national study, respectively)<sup>28</sup>. This result was expected because smoking prevalence is probably higher among younger women, as those enrolled in this study, living in urban areas were lung cancer mortality in women is higher than in women living in rural areas<sup>29</sup>.

The results of the study obtained at the one-year follow-up showed a percentage of cessation (12.4%) similar to those observed in studies on counseling for smoking cessation carried out by health personnel, excluding physicians<sup>5</sup>. The results at one year among those who never stopped smoking showed a reduction of the average daily consumption and a smaller proportion of women smoking immediately on awaking. Heavy smokers agreed to participate in the study, suggesting to be prone to receiving help to quit.

Interestingly, 15 participants (8.5%) quit between the six-month follow-up and the one-year follow-up. This may be due to the fact that most of the participants were at the determination level at enrollment. Moreover, the telephone interviews could have reinforced the motivation to quit.

It should be emphasized that it was not possible to corroborate the deception rate of participants, calculat-

ed in the study using the information obtained through interview, with other evidence (as from saliva, urine or plasma cotinine or expired CO).

Other limitations of the study should be noted: (i) first of all, the study did not have the aim to evaluate the efficacy of the applied intervention but just to verify its feasibility, and in fact no controls were enrolled; (ii) there was a selection bias in the population under study because the volunteers were likely smokers wishing to quit; anyhow, this is also a bias registered in most studies where the intervention cannot be imposed and the subjects under study were necessarily volunteers; (iii) the sample size was relatively limited due to the aforementioned objective of the study.

In conclusion, our results, though not yet confirmed by other studies, appear interesting in terms of public health, because cervical cancer screening represents an opportunity to contact a large number of young female smokers who, being generally healthy, have little need to contact general practitioners. However, before application on a larger scale, the efficacy of the proposed intervention needs further and more formal evaluation with the involvement of the health personnel directly responsible for Pap testing, the midwives. A randomized controlled trial for evaluation of this intervention (SPRINT Study: active and smoke-free women) is ongoing in four Italian towns (International Standard Randomized Controlled Trials Number 52660565)<sup>30</sup>. The results of the study suggest that there are opportunities for the implementation of brief interventions for smoking cessation when women undergo a Pap test.

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