

# Smoking and drinking habits before and during pregnancy in Spanish women

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## Abstract

**Study objective** – To investigate possible changes in smoking and drinking habits during pregnancy and to elucidate the sociodemographic factors associated with these changes in Spanish women.

**Design** – A cross-sectional survey.

**Participants and setting** – A total of 1004 pregnant women of between 12 and 18 weeks of gestation who were attending the antenatal clinic of the main regional hospital of Valencia (Spain) during 1989 were studied. All participants completed the study and only one eligible woman refused to participate when approached.

**Measurements and main results** – Information was obtained by structured questionnaire (Euromac questionnaire), which included items on age, educational level, marital status, occupation, parity, previous and present smoking habits, and previous and present alcohol consumption. Women were asked about the consumption of cigarettes and alcohol for a typical week before they knew they were pregnant, and details of current consumption were obtained for the week before the interview. The number of drinks taken per week was later converted to the amount of absolute alcohol (in g). Sixty per cent of the women smoked and 72% drank alcohol before pregnancy. Forty eight per cent of smokers stopped smoking and 37% of drinkers stopped drinking alcohol during pregnancy. No sociodemographic factor showed an independent association with either smoking or drinking cessation. Only the number of cigarettes and the amount of alcohol consumed before pregnancy were identified as significant independent predictors for stopping.

**Conclusions** – Pregnant Spanish women seemed to stop smoking at about three times the rate found in Spanish women in the reproductive years. The sociodemographic variables usually associated with stopping smoking could not account for the high rate of quitting in these Spanish women, a rate higher than that in women from other developed countries. The high prevalence of smoking before pregnancy might explain not only the high rate of stopping smoking but also the absence of a well defined profile of “quitters”. In our study, high levels of alcohol consumption were limited to a small group of pregnant women, and preventive efforts should be focused on this group.

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Spain has a high prevalence of cigarette and alcohol consumption in the general population compared with most European countries.<sup>1</sup> According to the data obtained by the regional health interview survey carried out in 1990 in Valencia, Spain (four million inhabitants), approximately 50% of the population were smokers and 65% were occasional and regular drinkers.<sup>2</sup> Among women of reproductive age, prevalences can be estimated to range from 48-58% for smoking and from 70-75% for drinking.<sup>2,3</sup>

The consequences that cigarette smoking and alcohol consumption during pregnancy may have on the fetus are now widely recognised. These range from low birthweight and reduced intrauterine growth to fetal loss and spontaneous abortion.<sup>4-20</sup>

Several studies have shown a change in smoking and drinking habits during pregnancy, but this change is uneven in different social class groups.<sup>21-25</sup> Smoking and drinking cessation during pregnancy have been associated with some sociodemographic characteristics such as age, level of education, marital status, occupation, parity, and previous level of consumption.<sup>21-25</sup> Most of these studies, however, were carried out in areas in which the prevalence of both drinking and smoking are lower than in Spain.<sup>26,27</sup>

In spite of the very high prevalence of these two factors in women of reproductive age, no attention has been paid to the smoking and drinking patterns of pregnant Spanish women. Without information on the actual prevalence during pregnancy and the sociodemographic profile of those who stop compared with those who continue to smoke and drink, the effectiveness of health promotion strategies directed at pregnant women is seriously compromised.

With the aim of obtaining such information, and as part of a larger European Union study on maternal alcohol consumption and its relation to the outcome of pregnancy<sup>12</sup> spanning seven member states, the determinants of smoking and drinking cessation in a sample of pregnant women in Valencia were investigated.

## Methods

All women attending the antenatal clinic of La Fe hospital in Valencia in 1989 and who were

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Table 1 Prevalence of smoking before pregnancy by sociodemographic characteristics in 1004 pregnant women and adjusted odds ratios (OR) estimated through logistic regression analysis

	No	Smokers (%)	Adjusted OR*	(95% CI)	p value
All women	1004	60.1			
Age (y):					
≤ 19	26	80.8	1		
20-24	197	67.0	0.66	(0.23, 1.90)	0.45
25-29	434	64.1	0.59	(0.21, 1.69)	0.34
30-34	252	56.7	0.43	(0.15, 1.25)	0.12
≥ 35	95	30.5	0.15	(0.05, 0.45)	<0.001
Educational level:					
No schooling or incomplete primary education	165	63.0	1		
Primary studies	540	60.2	0.92	(0.63, 1.34)	0.67
Secondary studies	210	60.0	0.80	(0.51, 1.25)	0.31
University studies	89	53.9	0.66	(0.35, 1.22)	0.19
Marital status:					
Married	940	58.8	1		
Unmarried	64	78.1	2.12	(1.11, 4.04)	0.02
Working status:					
Not working	565	58.2	1		
Manual job	318	63.5	1.21	(0.90, 1.62)	0.20
Non-manual job	121	59.5	1.31	(0.80, 2.16)	0.28
Alcohol consumption:					
No	274	48.9	1		
Yes	730	64.2	1.80	(1.35, 2.41)	<0.001

\* The logistic regression model includes all the variables shown in the table.

between 12 and 18 weeks' gestation were invited to take part in the study. They were informed of the nature of the study during the antenatal visit. Trained interviewers obtained the required information by means of the structured questionnaire used in the Euromac study.<sup>12</sup>

The questionnaire included items on age, educational level, marital status, occupation, parity, previous and present smoking habits, and previous and present alcohol consumption. The consumption of cigarettes and alcohol was determined for a typical week before the women knew they were pregnant. Current consumption was obtained for the week previous to the interview. Women who smoked before pregnancy were defined as those who said that they smoked at least one cigarette per day during a typical week before they knew they were pregnant. Women who drank before pregnancy were those who had at least one alcoholic drink per week before they found out they were pregnant. Women who stopped

smoking or drinking during pregnancy were defined as those who smoked or drank before pregnancy and had stopped by the time of the interview. Smokers were grouped according to the number of cigarettes smoked – 1–9, 10–19, and 20 or more cigarettes per day. The number of drinks taken per week were later converted to the amount of absolute alcohol (in g) following a procedure described elsewhere.<sup>12</sup> Drinkers were classified according to the amount of alcohol consumed – > 0–29, 30–59, 60–89, and 90 g or more per week. The prevalence of smoking and drinking before pregnancy and the proportion of quitters during pregnancy were calculated as percentages for each category of all the variables referred to above – age, educational level, marital status, occupation, parity, and previous alcohol and smoking habits.

The strength and precision of the associations between cigarette smoking, cessation of smoking, alcohol consumption and cessation of drinking, and each of the variables previously referred to, were assessed by means of adjusted odds ratios (OR) and their 95% confidence intervals (CI) calculated by logistic regression analysis. The statistical analysis was carried out using the GLIM software package.<sup>28</sup>

## Results

Altogether 1004 of the 1005 pregnant women who attended the antenatal clinic during 1989 answered the questionnaire: one woman refused to cooperate.

### SMOKING AND DRINKING HABITS BEFORE PREGNANCY

Sixty per cent of all women reported smoking cigarettes before pregnancy. Eighty per cent of women aged under 20 years were smokers. Smoking prevalence decreased with increasing age (table 1) and was lower in women with university degrees, married women, and those who did not drink alcohol. No differences in relation to the type of occupation were found.

The multivariate analysis showed that the only variables independently associated with smoking before pregnancy were age, marital status, and alcohol use (table 1).

Seventy two per cent of all women said that they drank alcohol at least once a week before pregnancy (table 2). Drinking tended to be more common in smokers and in unmarried and employed women.

When all other variables had been adjusted for, smoking and having a manual job at the time of the interview, taking as a reference the group of women who did not work, were the only variables that were significantly related to the risk of drinking before pregnancy.

### SMOKING AND DRINKING CESSATION DURING PREGNANCY

Women were more likely to stop smoking than to stop drinking during pregnancy (tables 3 and 4). Forty eight per cent of those who had

Table 2 Prevalence of drinking before pregnancy by sociodemographic characteristics in 1004 pregnant women and adjusted odds ratios (OR) estimated through logistic regression analysis

	No	Drinkers (%)	Adjusted OR*	(95% CI)	p value
All women	1004	72.7			
Age (y):					
≤ 19	26	73.1	1		
20-24	197	72.1	1.18	(0.44, 3.13)	0.72
25-29	434	74.0	1.34	(0.51, 3.50)	0.55
30-34	252	73.8	1.33	(0.50, 3.54)	0.56
≥ 35	95	65.3	1.08	(0.38, 3.04)	0.86
Educational level:					
No schooling or incomplete primary education	165	72.7	1		
Primary studies	540	71.3	0.91	(0.61, 1.36)	0.65
Secondary studies	210	74.8	1.02	(0.63, 1.67)	0.98
University studies	89	76.4	1.04	(0.53, 2.07)	0.92
Marital status:					
Married	940	72.2	1		
Unmarried	64	79.7	1.53	(0.78, 3.01)	0.23
Working status:					
Not working	565	69.0	1		
Manual job	318	76.7	1.46	(1.06, 2.01)	0.02
Non-manual job	121	79.3	1.61	(0.92, 2.82)	0.09
Tobacco consumption:					
No	401	65.1	1		
Yes	603	77.7	1.80	(1.35, 2.41)	<0.001

\* The logistic regression model includes all the variables shown in the table.

**Table 3** Smoking cessation during pregnancy by sociodemographic characteristics in 1004 pregnant women and adjusted odds ratios (OR) estimated through logistic regression analysis

	No*	Quitters (%)	Adjusted OR†	(95% CI)	p value
All women	603	48.3			
Age (y):					
≤ 19	21	33.3	1		
20-24	132	45.5	1.10	(0.33, 3.69)	0.87
25-29	278	46.8	1.21	(0.36, 4.02)	0.76
30-34	143	54.5	1.69	(0.48, 5.92)	0.41
≥ 35	29	55.2	1.39	(0.31, 6.18)	0.66
Educational level:					
No schooling or incomplete primary education	104	42.3	1		
Primary studies	325	49.2	1.26	(0.74, 2.12)	0.40
Secondary studies	126	46.8	1.59	(0.84, 3.01)	0.16
University studies	48	58.3	1.59	(0.64, 3.93)	0.32
Marital status:					
Married	553	50.5	1		
Unmarried	50	24.0	0.51	(0.22, 1.19)	0.12
Working status:					
Not working	329	48.9	1		
Manual job	202	46.5	0.80	(0.53, 1.20)	0.28
Non-manual job	72	50.0	0.88	(0.44, 1.78)	0.72
Alcohol consumption before pregnancy (g/wk):					
0	134	48.5	1		
> 0-	251	51.0	0.95	(0.58, 1.54)	0.83
30-	123	48.0	1.05	(0.59, 1.87)	0.88
60-	46	37.0	0.56	(0.25, 1.25)	0.16
≥ 90-	49	44.9	1.44	(0.65, 3.19)	0.37
Parity:					
No previous births	314	52.6	1		
1-2 previous births	281	47.7	0.75	(0.50, 1.14)	0.18
≥ 3 previous births	8	50.0	1.38	(0.28, 6.88)	0.70
Tobacco consumption before pregnancy:					
1- 9	258	73.6	1		
10-19	144	46.5	0.29	(0.19, 0.46)	< 0.001
≥ 20	201	16.9	0.07	(0.04, 0.11)	< 0.001

\* Number of women who smoked before pregnancy.

† The logistic regression model includes all the variables shown in the table.

the habit stopped smoking during pregnancy and 37% stopped drinking alcohol.

As table 3 shows, 55% of women > 35 years old quit smoking compared with 33% of those aged < 20 years. The proportion of "quitters" was higher in light smokers and married and

**Table 4** Drinking cessation during pregnancy by sociodemographic characteristics in 1004 pregnant women and adjusted odds ratios (OR) estimated through logistic regression analysis

	No*	Quitters (%)	Adjusted OR†	(95% CI)	p value
All women	730	37.3			
Age (y):					
≤ 19	19	42.1	1		
20-24	142	46.5	1.04	(0.36, 2.95)	0.95
25-29	321	35.2	0.67	(0.24, 1.89)	0.45
30-34	186	33.9	0.65	(0.22, 1.91)	0.43
≥ 35	62	35.5	0.62	(0.19, 2.00)	0.43
Educational level:					
No schooling or incomplete primary education	120	35.8	1		
Primary studies	385	35.1	0.98	(0.63, 1.52)	0.92
Secondary studies	157	42.0	1.34	(0.79, 2.26)	0.28
University studies	68	41.2	1.33	(0.66, 2.71)	0.43
Marital status:					
Married	679	37.3	1		
Unmarried	51	37.3	0.97	(0.50, 1.89)	0.94
Working status:					
Not working	390	36.7	1		
Manual job	244	38.1	1.12	(0.80, 1.58)	0.51
Non-manual job	96	37.5	0.87	(0.50, 1.51)	0.62
Tobacco consumption before pregnancy (g/wk):					
0	261	40.6	1		
1- 9	204	36.8	0.83	(0.56, 1.23)	0.36
10-19	108	37.0	0.82	(0.51, 1.32)	0.41
≥ 20	157	32.5	0.73	(0.47, 1.13)	0.16
Parity:					
No previous births	375	40.8	1		
1-2 previous births	330	33.3	0.78	(0.55, 1.10)	0.16
≥ 3 previous births	25	36.0	0.97	(0.37, 2.52)	0.95
Alcohol consumption before pregnancy:					
> 0-	407	43.0	1		
30-	179	32.4	0.62	(0.43, 0.91)	0.01
60-	63	28.6	0.53	(0.29, 0.96)	0.04
≥ 90-	81	25.9	0.45	(0.26, 0.77)	0.004

\* Number of women who drank before pregnancy.

† The logistic regression model includes all the variables shown in the table.

better educated women. Based on the logistic regression results, however, the previous level of cigarette consumption was the only predictor of smoking cessation after adjusting for all other variables. Women who smoked between 10 and 20 cigarettes a day were four times less likely to quit, and those who smoked more than one pack per day were 14 times less likely to quit than lighter smokers.

Table 4 shows the percentage of women who gave up drinking alcohol in relation to various sociodemographic characteristics. Quitting was more common in younger and better educated women, while heavy smoking and drinking before pregnancy tended to be associated with the persistence of alcohol drinking. After adjusting for all other variables in multivariate analysis, the amount of alcohol drunk before pregnancy was the only independent predictor of stopping drinking. Women who drank more than 60 g pure alcohol per week before pregnancy were half as likely to give up drinking during pregnancy as women who drank less than 30 g.

## Discussion

Overall, the prevalence of drinking was higher than the prevalence of smoking, and stopping drinking alcohol was less pronounced than the cessation of smoking.

The data pertaining to mothers' drinking habits before pregnancy resemble those of the general population of Spanish women in the reproductive years. The prevalence of smoking in our study, however, was higher than that in the Spanish National Health Survey, partly because of the different age groups in which the estimations were based.<sup>3</sup>

Although based on a small number of women, it is quite striking that more than 80% of pregnant women aged < 20 years smoked before pregnancy. This adds to the already greater health risk in adolescent pregnancy. More than 65% of women in their 20s smoked before pregnancy. This prevalence of smoking is twice that obtained in studies carried out in pregnant women in the United States,<sup>21,22</sup> Sweden,<sup>23</sup> and Italy,<sup>24</sup> although the classifying criteria are only specified in the first two studies.

In our study, smokers tended to be younger, unmarried, without university degrees, and consumers of alcohol. This agrees well with results from other studies.<sup>21,22,24</sup> Nevertheless, after adjusting for all other variables, the educational level was not significantly associated with smoking before pregnancy.

Pregnant women seem to stop smoking at about three times the rate of the population of Spanish women in the reproductive years.<sup>1</sup> This rate is quite similar to that obtained in Italy<sup>24</sup> and is higher<sup>22</sup> and much higher<sup>21,23</sup> than those in the United States and Sweden respectively. Contrary to results from other studies,<sup>21-25</sup> we could not establish any significant association between sociodemographic variables and stopping smoking. In fact, the only significant predictor of smoking cessation in our study was the previous number of cigarettes smoked.

Since our women were younger, less educated, and heavier smokers than women in the other studies,<sup>21-25</sup> the sociodemographic variables usually associated with stopping smoking cannot account in our case for the higher rate of quitting. The high prevalence of smoking before pregnancy we observed might explain not only the high rate of quitting but also the absence of a well defined profile of quitters. Pregnancy may be a powerful stimulus to give up, quite independently from other factors, particularly when we consider that Spanish women have not been motivated to quit by systematic anti-smoking campaigns. In other countries where women have been exposed to vigorous anti-smoking campaigns, those who continue to smoke are self selected and thus the rate of quitting during pregnancy could be expected to be lower and affected by social factors.

Although the percentage of women who quit smoking during pregnancy was higher in our study, the fact that the prevalence of smokers before pregnancy was much higher made that the final prevalence of smokers during pregnancy was around 30% in our study compared with approximately 20% in all other studies.<sup>21-25</sup> This high prevalence of smoking presents an important public health problem because of its association with unfavourable perinatal outcomes. However, the relatively high rate of smoking cessation during pregnancy is encouraging compared with that in the general population.<sup>1</sup> Moreover, most persistent smokers in our study cut down on the amount smoked during pregnancy (data not shown). This suggests a spreading awareness in pregnant women of the detrimental effect of smoking during pregnancy.

No clear sociodemographic profile for smoking cessation was found in our study. In spite of the small number of women in some of the defined subgroups, the most likely explanation for this result is that anti-smoking campaigns – which have started quite recently in Spain – have not yet permeated any specific group in society, and no social gradient has yet emerged.<sup>1</sup> Only the number of cigarettes smoked before pregnancy appears as a significant predictor for quitting. Our findings have clear implications for setting policies with regard to smoking cessation. Antenatal smoking cessation programmes should be targeted at heavy smokers, particularly the young and adolescents, to help them to give up smoking through coping skills and other specialised techniques. However, because of the magnitude of the problem, specific programmes directed at pregnant women would not be sufficient. Primary prevention programmes for the general population are urgently needed in Spain if the prevalence of smoking and its consequences for pregnant women is to be significantly reduced.

There are no data on drinking cessation in the general population so we are unable to compare these with our results. Compared with other studies,<sup>21 24 25</sup> more women in our study stopped drinking during pregnancy, although the differences were not as marked as

with cigarette consumption. Quitters tended to be older, better educated, and with lower levels of tobacco and alcohol consumption before pregnancy. The previous amount of alcohol consumed was the only variable significantly associated with quitting.

Most women in our study were light drinkers both before and during pregnancy. Although they were attending an antenatal clinic, and thus might be more health conscious, the fact is that 95% of all women who deliver at La Fe hospital have attended antenatal clinics. As conclusive evidence has only been reached regarding the deleterious effects of heavy but not moderate alcohol consumption on pregnancy outcomes,<sup>12</sup> our findings suggest that in our area alcohol related perinatal health problems would be confined to a small group of pregnant women. Since these heavier drinkers were also more reluctant to give up drinking during pregnancy, preventive efforts should be concentrated on them.

This study is part of the European Union Concerted Action: maternal alcohol consumption and its effect on pregnancy and child development.

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## John A Ryle on “social medicine” and “public health” (1948)<sup>1</sup>

### PREVENTION OR CURE (50 YEARS ON)?

“For a very long time we have accepted the old adage ‘Prevention is better than cure’. In our new era the belief in it – for of its truth there can be no doubt – must remain ever more manifest in our research and its directives and in our teaching. The most conspicuous interest of the student ten or twenty years hence will, I hope, no longer be in the rare or difficult and too often incurable case, but in the common and more understandable and preventable disease. May the daily questions on his lips become not ‘What is the treatment?’ but ‘What are the causes?’ and ‘If preventable, then why not prevented?’ ”

“The study of the ultimate causes of disease – the procatarctic causes without which the specific factors can never find their opportunity – goes hand in hand with the study of the causes of health, and how much we have still to learn of the meaning and measurement. When social pathology and hygiology come into their own we may witness a return – but this time with fuller scientific authority for the guidance of the people and their teachers and rulers – of that ancient pride in health as a cultural objective which has been largely in abeyance since the days of the old Greek civilization.”

“The training of the doctor, which began with observations on and the care of the sick individual, is due now for a great forward stride. Observations on whole communities, whether great or small (or on appropriate samples), and improved health provisions for them, must henceforward become the prior objective. The individual is not likely to suffer neglect in the process, for all communities are composed of individuals. For generations yet we shall doubtless continue to build our costly hospitals and clinics, and require our armies of

practitioners and ancillaries, but meanwhile we must at least embark upon the crusade which will end in the steady reduction of waiting-lists and the closure of hospital wards, and which will eventually put the physical, mental, and moral health of peoples before their material wealth. In that crusade – whether by our researches, by realistic reforms in teaching, by the better education of the people or direct representations to government – it is our first duty as physicians to explore and prepare the way.<sup>11</sup>

“I submit that we can only do this effectively by electing to pursue the study of social man in sickness and in health as assiduously as we have hitherto pursued the study of individual man in the isolation of the consulting room or the hospital bed, when health has finally passed him by. The quality of our actions and our practice and of our leadership in social reformation will depend, as in the past, on many disciplines, but not least, perhaps, upon the science whose history I have briefly sketched and whose province I have endeavoured to define.”

*John Alfred Ryle (1889–1950) was elected physician to Guy’s Hospital, London in 1924 (the Ryle nasogastric tube bears his name). In 1935, he was appointed to the Chair of Physic (internal medicine) in Cambridge, but he returned to work in London during the second world war, until 1943 when he was made Professor of Social Medicine—the first such appointment in the UK. Ryle relinquished one of the largest consulting practices in London to become a pioneer of social and preventive medicine.*

1 Ryle JA. *Changing disciplines*. London: Oxford University Press, 1948. Extracted from quotations in Buck C, Llopis A, Nájera E, Terris M. *The challenge of epidemiology. Issues and selected readings*. Washington: Pan American Health Organization, Regional Office of the WHO, 1989.