Exposure to tobacco, alcohol and drugs of abuse during pregnancy. A study of prevalence among pregnant women in Malaga (Spain)

Exposición a tabaco, alcohol y drogas de abuso en gestantes. Estudio de prevalencia en gestantes de Málaga (España)

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Abstract

The prevalence of substance abuse in women who become pregnant is similar to that of the general population, resulting in a high fetal exposure rate during the most vulnerable period regarding neurodevelopment and organogenesis. The present study was intended to assess the level of prenatal exposure to tobacco, alcohol or illicit drugs in the city of Málaga (Spain). It was designed as a cross-sectional study, and based on the anonymous self-reports of participants. A total of 451 pregnant women were recruited in the first, second or third trimester. The prevalence in each of the quarters respectively was 21.2%, 18.5% and 13.3% for smoking, 40.7%, 23.1% and 17.1% for alcohol and 4.8%, 1.9% and 1.2% for cannabis. We also found that a higher educational level was associated with a lower consumption of tobacco (RR 0.659 [0.537-0.810] p<0.0001) and greater exposure to alcohol (RR 1.87 [1.30-2.69] p<0.0007). These results, particularly in regard to alcohol intake, are sufficiently alarming to alert obstetric care providers about the need to implement preventive measures.

Key words: Prenatal exposure, Maternal alcohol intake, Maternal smoking, Prevalence, Drug abuse during pregnancy, High risk pregnancy.

Resumen

La prevalencia de hábitos tóxicos en la población de mujeres que quedan embarazadas es similar a la de la población general, por lo que la exposición fetal a tóxicos es elevada en el período de mayor vulnerabilidad, sobre todo en relación al neurodesarrollo y la organogénesis. El presente estudio ha sido desarrollado para conocer el nivel de exposición prenatal a tabaco, alcohol u otras drogas en la ciudad de Málaga (España). El trabajo responde a un diseño observacional de corte transversal sobre el consumo de tóxicos durante el embarazo, y se basa en la autodeclaración de las gestantes mediante la cumplimentación de un cuestionario. Se reclutaron 451 gestantes de primer, segundo y tercer trimestre. La prevalencia de consumo en cada uno de los trimestres resultó ser respectivamente del 21.2%, 18.5% y 13.3% para el tabaco, 40.7%, 23.1% y 17.1% para el alcohol y del 4.8%, 1.9% y 1.2% para cannabis. En los tres trimestres, un mayor nivel de estudios se asoció a un menor consumo de tabaco (RR 0,659 [0.537-0.810] p< 0.0001) y una mayor exposición al alcohol (RR 1.87 [1.30-2.69] p< 0.0007). Los resultados obtenidos, sobre todo en relación al consumo de alcohol, son suficientemente llamativos como para alertar a los proveedores de atención obstétrica sobre la necesidad de poner en marcha medidas preventivas.

Palabras clave: Exposición prenatal, Consumo materno de alcohol, Tabaquismo materno, Prevalencia, Drogas ilícitas durante el embarazo, Alto riesgo obstétrico.

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According to data obtained by the National Plan for Drugs (Government Delegation for the National Plan for Drugs, 2011) in a household survey of Spanish citizens between 15 and 64 years of age, 35.1% of those questioned consumed tobacco daily and 15.3% drank alcohol. Consuming cannabis in the last 30 days was reported by 6.5%; the figures for cocaine and amphetamines were 1.4% and 0.6% respectively. Data gathered by the National Health Survey in 2012 showed that 61.4% of women of fertile age drank alcohol during the previous year (Ministry for Health, Social Services and Equality, 2013). The prevalence of substance abuse among women who become pregnant is similar to that in the general population, signifying high fetal exposure during the first trimester, with a large group of patients still maintaining a high level of exposure at the end of pregnancy (Cnattingius, 2004).

Although it is very difficult to estimate all the consequences of the consumption of these substances, we at least know that the effects on the fetus depend fundamentally on the moment and intensity of exposure, with the first trimester being the most vulnerable, above all with respect to the neurodevelopment and organogenesis. The consumption of toxic substances has also been linked to intrauterine growth retardation, placental abruption, premature birth (Bernstein, Plociennik, Stahle, Badger & Secker-Walker, 2000; Bouras et al., 2013), miscarriage, ectopic pregnancy, and sudden infant death (National Committee for the Prevention of Smoking, 2007; Genbacev, Blass, Joslin & Fisher, 1995; Toothily, Stewart, Coles, Andrews & Cartlidge, 1999). Not a great deal of information has been gathered in Spain regarding the prevalence of substance abuse during pregnancy. Studies of tobacco consumption show a prevalence of between 27% (Doz-Mora et al., 2002) and 34% of pregnant women at the end of pregnancy (Pichini et al., 2002). Furthermore, Martínez-Frías, Rodríguez-Pinilla & Bermejo (2005) have observed a tendency towards increased smoking among pregnant women since 1975, with a prevalence of 30% between 1995 and 2002. With regard to alcohol consumption, the Eurocare group (2011) reports that in our country, 25% of women consume alcohol during pregnancy, and that there is an incidence of fetal alcohol syndrome of 0.46 per 1000 births (Eurocat, 2014). There are no national data regarding the prevalence of fetal alcohol spectrum disorder, but in other countries these figures can be up to ten times more frequent. Data on the consumption of illicit drugs is scarce. In a study carried out in Barcelona on samples of meconium, 5.3% tested positive for cannabis, 4.7% for heroin and 2.6% for cocaine (García-Algar et al., 2009).

This study has been designed with the aim of discovering prenatal levels of exposure to tobacco, alcohol and other drugs in the city of Malaga, and to propose public health strategies which can be added to existing ones in order to reduce the negative impact of the consumption of these substances during pregnancy and on the health of newborns. The systematization of obstetrical care through the design of care procedures enables the development of interventions towards this end. Based on scientific evidence, the clinical practice guide for normal births (Working group of the Clinical Practice Guide on Pregnancy and Infant Care, 2014) establishes some recommendations and suggestions as to the detection of risk behavior linked to substance abuse, although the integration of such recommendations in health care practice depends on local factors related to the organizational context and to the motivation of the staff involved, and no data exists regarding compliance at the national level. The efficacy of educational intervention on the reduction of consumption during pregnancy has already been evaluated in previous studies (Chang, Wilkins-Haug, Berman & Goetz, 1999; O´Connor & Whaley, 2007; Reynolds, Coombs, Lowe, Peterson & Gayoso, 1995), although none of these were carried out in Spain.

Our study is positioned within a line of research into reproductive health aimed at avoiding exposure of pregnant women to tobacco, alcohol and other drugs.

Method

To study the prevalence of exposure to tobacco, alcohol or other substance abuse among pregnant women in Malaga, an observational, descriptive, transversal study of prevalence was designed. Before the study was initiated, the corresponding authorization of the Ethics and Research Committee of Northeast Malaga was obtained.

Participants

The population of the study consisted of pregnant women who attended obstetric check-ups at our hospital during the months of November and December 2101.

Our maternity unit is the reference center for specialized obstetric and gynecological care in 14 primary care centers in the Malaga health district, with more than 5000 deliveries in 2013. Although there are other centers with obstetric services in Malaga, the volume of activity means that the population attended to in our center is highly representative of the general population of pregnant women in the city.

In the organization of obstetric care in Andalucía it is normal that women with low-risk pregnancy attend

primary care centers to control their pregnancy, coming to our hospital once in every trimester for a clinical evaluation and ultrasound scan carried out by the obstetric and gynecological specialist. These visits are programmed for weeks 12, 20 and 32.

The population of the study was made up of patients who attended the obstetric control center in weeks 12, 20 or 32. Given the empirical prevalence (Cnattingius, 2004) of smoking between 20% and 40% and a frequency of alcohol consumption (García-Algar et al., 2008) among pregnant women of up to 45%, we estimated that for a 95% confidence interval and 5% accuracy it would be necessary to recruit at least 350 pregnant women to obtain a representative sample.

Consecutive sampling was carried out on pregnant women who attended obstetric controls at our maternity ward in the last quarter of 2013, generating a final sample of 451 participants. Of these, 184 were in the first, 121 in the second and 146 in the third trimester.

Procedure

The patients who agreed to participate in this study answered questions about tobacco, alcohol and other drugs presented in a consumption questionnaire. Alongside the questionnaire, an informational consent form was handed out which, as well as explaining the reasons for the study, highlighted the fact that responses would be treated anonymously. The pregnant women deposited the completed questionnaire in a sealed box themselves, ensuring the impossibility of tracing any of the forms since they lacked all personal data. In order to safeguard the anonymity of the patients, no signature was required at any time, on the understanding that the completion of the questionnaire and posting it in the collection box constituted implicit agreement to being included in the study. All patients could refuse to participate before, during or after completion of the questionnaire, right up to the moment of posting it in the collection box. Nevertheless, the number of pregnant women who refused to participate was less than 3.2%.

Instruments

Participants answered a self-administered and anonymous questionnaire (Appendix 1) on substance consumption, based on direct questions focused on assessing whether substances were consumed, as well as frequency and intensity. These questions were in turn adapted from questionnaires validated and used in previous studies of prenatal exposure to substance abuse during pregnancy (Gómez, Conde & Aguiar, 2001). In terms of tobacco consumption, patients had to state the number of cigarettes smoked daily or weekly, at the moment of response and also before pregnancy, as well as the age of smoking onset. At the same time, the patient was asked about the smoking habits of her partner. For data referring to alcohol consumption, patients were asked whether or not they drank, about the absolute quantity consumed (number and type of drinks) as well as frequency. Items were incorporated from the domain of high-risk alcohol consumption of the AUDIT test (Babor, Higgins-Biddle, Saunders & Monteiro, 2001). With reference to other substance abuse, the women were presented with questions about the consumption of cannabis, cocaine, ecstasy, methadone, heroin or amphetamines, and the frequency of such, whether daily, weekly, monthly or occasional. The questionnaire also included questions regarding the socio-demographic and family context of the women relating to occupation, educational level, number of pregnancies, assisted reproduction, nationality, home postal code, consumption of tobacco, alcohol or drugs of abuse prior to pregnancy and consumption of the same by their partners.

Data analysis

The dependent variables considered referred to socio-demographic and health aspects: the woman's age, trimester of pregnancy, educational level, occupation, number of pregnancies, use of assisted reproduction techniques, nationality, postal code, consumption of tobacco, alcohol or drugs of abuse prior to pregnancy and by her partner.

The principal outcome variables studied were consumption of tobacco, alcohol and other drugs of abuse. The three variables were coded as dichotomous variables (consumption or non-consumption). Information regarding the frequency of consumption in the three cases was collected in the shape of categorical variables (daily, weekly, monthly, occasional consumption or non-consumption). The intensity of tobacco consumption was studied through the outcome variable of number of cigarettes consumed (ranging from 0 to n).

To study the intensity of alcohol consumption, we measured the volume of alcoholic drinks consumed (shot glass, standard glass, can, bottle) daily, weekly or monthly, according to each woman's declared drinking pattern, and distinguishing between consumption of beer, wine or spirits (straight or mixed). For subsequent coding and analysis, the volumes were converted into standard drink units (SDU). An SDU in Spain contains 10 grams of pure alcohol, with the conversion from volume to SDU done in the following way: a standard serving of beer or wine equals 1 SDU, and a standard serving of spirits equals 2 SDUs (Llopis, Gual & Rodríguez-Martos, 2000).

Finally, to analyze the consumption of drugs of abuse, a variable was coded to gather the frequency (dai-

ly, weekly or occasional) of cannabis, cocaine, ecstasy, methadone, heroin or amphetamine consumption. A descriptive analysis of the variables was initially carried out. The analysis of the independent variables enabled stratification of the sample on the basis of its different categories. To test for possible significant differences in the observed frequencies across the different stratification groups, the Chi-squared test was applied when the dichotomous variables of tobacco, alcohol and other substance consumption was analyzed. For bi-dimensional tables we have calculated the risk ratios and their 95% confidence intervals. Having checked for the normality of the distribution, to analyze the differences among the values of the continuous variables (intensity of consumption) the Student's t-test was applied to two independent samples or single-factor ANOVA when the number of categories of the independent variable was superior to two. The statistical analyses were carried out using SPSS 15.0 (SPSS Inc., Chicago, IL).

Results

The main demographic characteristics of the women in the study are reflected in Table 1. The average age was 31.4 (SD 5.2), 55.16 were first-time pregnancies and 92.7 were Spanish nationals. Of the non-Spanish patients, those from the Maghreb were the most numerous.

In terms of tobacco consumption, 152 pregnant women stated they were smokers (33.7%), of which 68 continued smoking during pregnancy; we thus found a 15.07% prevalence of smoking during pregnancy. In our sample, tobacco consumption was lower at the end of pregnancy, with third trimester smoking down significantly compared to first and second trimesters (÷2 = 13.114 and 18.715, p<0.0003 and p <0.0001, respectively). The distribution by trimester can be seen in Table 2.

A total of 123 pregnant women admitted to drinking or having drunk alcohol during pregnancy, resulting in global exposure prevalence of 27.2% during pregnancy, and an average of 16.5 SDUs (SD 20.5). Consumption was significantly greater (÷2 = 9.48 p<0.002) in the first trimester group (40.7%), and progressively lower in the other trimesters (23.1% in the second trimester group, and 17.1% in the third). In the group of women exposed to alcohol, 52.8% declared a consumption of 1 or 2 weekly SDUs, with 3.1% admitting a consumption of more than 10 SDUs.

The type of drink most frequently consumed was beer (68.8% of women), followed by spirits (26.9%) and wine (20.8%).

Table 1
Principal socio-demographic characteristics of the sample

Caracteristics	1st Trimester (N = 184)	2nd Trimester (N = 121)	3rd Trimester (N = 146)
Age			
Age in years	30.4	33.6	30.2
First pregancy	108 (58.7%)	62 (51.2%)	55 (55.6%)
Employment situation			
No schooling	46 (25.3%)	26 (21%)	47 (32.1%)
Working	104 (57.1%)	77 (63%)	69 (37.5%)
Looking for work	32 (17.6%)	18 (14.5%)	29 (19.8%)
Educational level			
No schooling	13 (7.1%)	4 (3.3%)	11 (7.5%)
Compulsory	64 (34.8%)	29 (24%)	46 (31.5%)
High school diploma or equivalent	44 (23.9%)	39 (32.2%)	34 (23.2%)
University	57 (31%)	47 (38.8%)	31 (21.2%)
Nationality			
Spanish	163 (90.1%)	113 (95.0%)	91 (91.7%)
Eastern European	2 (1.1%)	-	1 (0.6%)
South American	5 (2.8%)	2 (1.7%)	5 (4.1%)
Chinese	1 (0.6%)	-	1 (0.6%)
African	1 (0.6%)	-	2 (1.2%)
Maghreb	8 (4.4%)	2 (1.6%)	3 (1.8%)
Assisted Reproduction			
No	175 (95.6%)	106 (88.3%)	142 (97.2%)
Yes	7 (3.8%)	13 (10.8%)	4 (2.8%)

Table 2
Exposure to tobacco during pregnancy

Tobacco	1st Trimester (N = 184)	2nd Trimester (N = 124)	3rd Trimester (N = 146)
Onset age			
Age in years	16.7 (DT 2.9)	17.2 (DT 3.3)	17 (DT 2.7)
Before pregnancy			
Smoked	67 (36%)	37 (29.6%)	48 (35.7%)
Did not smoke	117 (63.6%)	87 (69.6%)	98 (64.3%)
During pregnancy			
Smoke	39 (21.2%)	23 (18.5%)	6 (13.3%)
Does not smoke	145 (78.8%)	101 (81.5%)	140 (86.7%)
No. of cigarettes			
Before	13.0 (DT 6.2)	14.3 (DT 7.7)	14.8 (DT 9.0)
During	4.9 (DT 3.3)	6.3 (DT 4.4)	7.9 (DT 8.0)
Her partner smokes			
Yes	60 (32.6%)	32 (26%)	34 (34.3%)
No	116 (63%)	89 (73%)	64 (64.6%)
Passive smoking			
At home	39 (21.3%)	18 (15.1%)	14(14.7%)
At work	9 (4.9%)	7 (6%)	4 (4.2%)

The number of consumers increased significantly among women in the first and second trimesters of pregnancy, at the weekend (÷2 = 9.8 and 9.56, p<0.0017 and p<0.002 respectively), rising 29.1% above weekday levels. Of pregnant women who drank, 11.3% did so daily, 35.3% weekly and 54.3% on a monthly basis. Table 3 shows the main results by trimester of pregnancy.

In terms of illicit substance use (Table 4), 11 patients admitted having consumed cannabis during pregnancy, equivalent to 2.43%. No other pregnant women admitted to taking any other type of illicit drug.

Table 3
Exposure to alcohol during pregnancy

Alcohol	1st Trimester (N = 184)	2nd Trimester (N = 121)	3rd Trimester (N = 146)
Consumption			
Yes	75 (40.7%)	28 (23.1%)	25 (17.1%)
No	109 (59.3%)	93 (76.5%)	121 (82.9%)
Type of drink on weekdays			
Beer	40 (57%)	11(39.3%)	18 (70%)
Wine	20 (28.6%)	11 (39.3%)	7 (25%)
Spirits	13 (18.6%	2 (7.1%)	1 (5%)
Type of drink on weekend/holidays			
Beer	47 (67.1%)	20 (71.4%)	17 (68%)
Wine	29 (41.4%)	14 (50%)	7 (28%)
Spirits	27 (38.6%)	4 (14.3%)	7 (28%)
Frequency of consumption			
Daily	9 (12.8%)	2 (7.1%)	3 (12%)
Weekly	24 (34.2%)	10 (35.7%)	9 (36%)
Monthly	40 (57.1%)	14 (50%)	14 (56%)
SDUs weekly			
<2 SDUs	36 (51.4%)	18 (64.2%)	11 (55%)
2-10 SDUs	28 (40%)	9 (32.1%)	9 (32.1%)
>10 SDUs	6 (8.6%)	1 (5%)	
SDUs weekly			
Average	16.7 (DT 20.6)	8.5 (DT 11.1)	12 (DT 9.9)

Table 4
Exposure to cannabis during pregnancy

Illicit drugs	1st Trimester (N = 184)	2nd Trimester (N = 121)	3rd Trimester (N = 146)
Marihuana consumption			
Yes	7 (4.8%)	2 (1.9%)	2 (1.2%)
No	137 (85.2%)	103 (98.1%)	83 (98.8%)

Table 5
Association of high education level and partner smoking habits with tobacco and alcohol consumption (RR: relative risk)

	First T	Second T	Third T
High education level			
Tobacco consumption			
RR	0.341	0.455	0.778
IC95%	(0.187-0.623)	(0.206-1.00)	(0.345-1.756)
Signif.	p<0.0001	p<0.039	p<0.39 NS
Alcohol consumption			
RR	2.455	4.091	3.143
IC95%	(1.298-4.641)	(1.134-14.759)	(0.95-10.21)
Signif.	p<0.004	p<0.017	p< 0.042
Partner smoking habits			
Tobacco consumption			
RR	17.208	24.364	5.576
IC95%	7.648-38.721	(7.749-76.606)	(2.272-13.685)
Signif.	p<0.0001	p<0.0001	p<0.0001

We did not observe differences in the consumption of tobacco, alcohol or other drugs in any of the trimesters linked to age, number of pregnancies, employment situation, nationality, or district of residence. We did however find a significant difference between educational level and the consumption of tobacco and alcohol, globally and by trimester. It is worth noting that smoking was less prevalent among pregnant women with higher educational level (RR 0.659 [0.537-0.810] p< 0.0001), while in contrast alcohol consumption was more frequent among those with higher educational level (RR 1.87 [1.30-2.69] p< 0.0007). Table 5 contains the risk ratios for each of the trimesters.

We have observed a significant association between smoking during pregnancy and the smoking habits of partners, with RR 3.091 [2.501-3.820] p< 0.0001. Furthermore, alcohol consumption in the first trimester was linked to smoking (RR 2.357 [1.243-4.469] p<0.006). This association did not prove significant en the second or third trimester.

Discussion

This study investigates the consumption of toxic substances during pregnancy in a cross-sectional observational design. The limits of a study based on self-reports of pregnant women has been shown in previous studies (Aranda, Mateos, González,

Sánchez & Luna, 2008). In our study, an anonymous self-administered questionnaire was applied in which the responses were untraceable, and which the women

themselves posted in a sealed collection box, thus providing a guarantee of confidentiality and increasing the reliability of the responses. Furthermore, despite the need to take possible under-reporting into account (Castellanos et al., 2000), the results obtained are striking enough, especially in terms of alcohol consumption, to alert the providers of obstetric care of the need to introduce preventive measures.

Pregnancy appears to have a modulating effect on tobacco consumption, given that the proportion of pregnant women who smoked prior to pregnancy was 36% while only 21.2% continued smoking during pregnancy. The proportion of smokers in the second and third trimester groups was also smaller, with the women in the third trimester exhibiting the lowest consumption (13.3%) as well as the greatest difference between women who smoked before pregnancy (35.7%) and those who continued to do so. The physical demands of third trimester, alongside the health promotion measures carried out in primary care are the most influential factors in this trend. It is nevertheless striking that levels of smoking reported in the first trimester are similar to those described 30 years ago (Herrera, 1989). The information campaigns developed over recent years have had a limited effect in reducing consumption, especially during the initial stages of pregnancy. In fact, despite various studies showing a decreasing pattern of habitual smokers among young Spanish people, the onset of smoking is getting noticeably earlier among women, as are their numbers, in comparison to men of the same age (Villalbí et al., 2012), a fact which may be linked to the marketing strategies of the tobacco multinationals or to aspects related to gender identity (Amos & Bostock, 2007). Although health surveys show that the prevalence of smoking is similar in both sexes, or slightly higher among males, the number of smokers of reproductive age is very high, with the proportion of women smokers who become pregnant reaching 36% in our study.

In addition, we have observed significantly higher consumption of alcohol among women with higher educational level in the first and second trimesters. The existence of social, educational, and occupational gradients in the consumption of alcohol has been shown previously in studies of the overall female population; the National Health Survey 2011-2012 for example, showed that while 52.05% of women between 25 and 64 years of age with higher education had drunk alcohol in the 2 weeks prior to the survey, only 33.86% of women with lower educational level had done so. Furthermore, 71.1% of female university graduates had drunk alcohol in the previous year, in contrast with 27.9% of women without a degree, with the same difference in all age groups (National Statistics Institute, 2013).

It is remarkable that women with a higher level of education, and therefore greater access to information regarding the potential effects of alcohol during pregnancy should display a higher tendency to drink. It is possible that the social habits of these women are different from those with a lower educational level, thus conditioning differences in consumption. Although there is no agreement in the international literature on tolerable levels of alcohol intake during pregnancy, the health care authorities in Spain recommend abstaining. Indeed, the Spanish Ministry of Health, Social Policy and Equality (2010) uses the slogans "Pregnancy: zero alcohol" or "If you're pregnant, there's no excuse" in its campaign to prevent alcohol consumption during pregnancy. Although the messages of such prevention programs are getting through, since alcohol consumption does decrease during pregnancy, it would be important to discover better ways of communicating with the groups at greater risk. The systematization of obstetric care with monthly visits to health centers or hospitals to control pregnancy represents an opportunity to offer pregnant women information referring to the need to avoid alcohol, in our view an ideal method of communication with the susceptible population.

Pre-conception counseling and the first obstetric check-up offer the ideal framework for communicating the unequivocal message that toxic substances must be avoided and starting educational strategies specifically integrated in maternal education.

The efficacy of educational intervention in reducing consumption during pregnancy has been variously studied (Chang et al., 1999; O´Connor, 2007; Reynolds et al., 1995), and, although results are mixed, it appears that psychological and educational interventions may help to reduce alcohol consumption or help women to abstain during pregnancy. To this end, health care staff involved in the interventions need to be motivated and prepared. In our context, neither the effect of such interventions on alcohol consumption during pregnancy nor the level of implementation in the different autonomous communities has been assessed.

The first trimester of pregnancy, at least the first half of it, goes unnoticed by many women, especially in cases of unplanned pregnancy. This leads to first trimester alcohol consumption of 40.7%, in line with data published for Spanish cities of a similar profile, such as Barcelona (García-Algar et al., 2008). It is worth noting in this context that alcohol consumption is also linked to sexual risk behaviors in unplanned pregnancies as has recently been revealed in Spain by Espada, Morales, Orgilés, Piqueras & Carballo (2013), indicating that the use of contraceptives is 1.4 times less frequent among adolescents having sex under the influence of alcohol.

As we have pointed out previously, pregnancy itself may modify consumption, with the proportion of drinkers being lower among second and third trimester patients. Nevertheless, levels of consumption of 23.1% and 17% among second and third trimester groups respectively are excessively high if we take into account the 2010 Health Ministry target of abstention during pregnancy (Ministry of Health Social Policy and Equality, 2010).

Although half of the pregnant women report a sporadic drinking pattern (monthly), 12.8% of first trimester, 7% of second trimester and 12% of third trimester patients admit drinking daily. Furthermore, although somewhat more than half the pregnant women declare a weekly intake of below 2 SDUs, more than a third admit to drinking up to 10 SDUs. It needs to be pointed out that while there is no consensus as to what may be considered a harmless level of alcohol, the potential effects on the fetus, in both perinatal results (prematurity, low weight, or fetal alcohol syndrome) (Patra et al., 2011), as well as fetal alcohol syndrome disorder in the longer term (López & Arán, 2010) dictate that women be strongly dissuaded from alcohol consumption during pregnancy (Working group of the Clinical Practice Guide on Pregnancy and Infant Care, 2014; Ministry of Health, Social Policy and Equality, 2010; Poli et al., 2013). The WHO highlights the advantages of advocating complete abstinence during pregnancy as well as developing intervention measures for pregnant women who drink.

We have found that 2.43% of pregnant women admit to using cannabis, although none of the women reported consuming other illegal drugs. The Collaborative Spanish Study of Congenital Malformations 1976-1996 showed how the consumption of drugs varied depending on the ethnic group of the pregnant woman, ranging from 5.5% among ethnic Gypsies and 1.1% among white Caucasians (Martínez-Frías, 1999). It is possible that potential legal and socio-health connotations associated with illicit drugs are obstacles preventing the women included in our study from admitting the consumption of drugs other than cannabis. Nevertheless, the fetal and neonatal morbidity associated with the consumption of such drugs emphasizes the need to include information about these substances in the educational intervention measures during pregnancy with the aim of reducing consumption.

There is a variety of aspects which limit the interpretation of the results of our study. The application of a self-administered questionnaire involves a potential bias factor derived from under-reporting by patients. In addition, no laboratory tests have been carried out which would allow objective corroboration of consumption levels found, with the result that real levels may well be even higher than those claimed by the patients. Furthermore, the aim of simultaneously examining the consumption of tobacco, alcohol and other drugs, as well as their intensity, led to the use of a single questionnaire, developed with questions which had been previously validated, although the questionnaire as a whole has not been subjected to the relevant validation process. Finally, given the transversal nature of the study, we have obtained data about the prevalence and intensity of substance use without being able to analyze the progression of consumption during the course of the different trimesters. Nevertheless, the results obtained are sufficiently conclusive to urge that health education campaigns aimed at preventing substance use during pregnancy be intensified by providing suitable information for pregnant women and incorporating specific educational strategies which cover all stages from pre-conception to nursing. The implementation of pre-conception counseling, and the design of pregnancy training programs with sessions aimed at achieving abstinence during pregnancy (and nursing) are proposed as necessary strategies in our environment. In putting such measures into practice, the role of health professionals both in the areas of primary and specialized care is fundamental in the diffusion of unequivocal messages.

Conflict of interests

The authors declare that there is no conflict of interests.

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Annex 1. *Consumption questionnaire*

DATOS DEMOGRÁFICOS

Edad: ..... Profesión: ..... Semana de gestación: .....

¿Trabaja actualmente fuera de casa?: ❑ Sí ❑ No ❑ Está en paro busca empleo

Estudios: ❑ No estudios ❑ Obligatorios (ESO) ❑ Bachillerato ❑ Universitarios

Nacionalidad: ❑ España /Europa ❑ Europa Este ❑ Asia-Filipinas
❑ Centro-Sudamérica ❑ España etnia gitana ❑ África-Caribe
❑ India-Pakistán ❑ China ❑ Magreb

¿Tiene hijos? ❑ Sí ❑ No ¿cuántos? .....

¿Ha tenido abortos? ❑ Sí ❑ No ¿cuántos? .....

Este embarazo ha sido ❑ Natural ❑ Inseminación ❑ In vitro

Código postal del domicilio: ..... Código postal del .....

TABACO

¿Fumaba antes del embarazo? ❑ Sí ❑ No

¿Ha fumado algo en estas últimas 2 semanas? ❑ Sí ❑ No

¿Cuántos cigarrillos al día o a la semana está fumando? al día .....
a la semana .....

¿Su marido/pareja fuma? ❑ Sí ❑ No ❑ Lo ha dejado antes del embarazo

¿Cuántos cigarrillos al día fumaba antes del embarazo? .....

¿A qué edad empezó a fumar? .....

ALCOHOL

De Lunes a viernes. Indique con qué frecuencia consume bebidas alcohólicas entre semana. Especifique también el tipo de bebida.

	RECIPIENTE (elegir uno)	**DIARIAMENTE** Número de veces: 0, 1, 2,...	**SEMANALMENTE** Número de veces: 0, 1, 2,...	**MENSUALMENTE** Número de veces: 0, 1, 2,...
CERVEZA	Vaso, lata, jarra, botella mediana, quinto			
VINO	Vaso, copa, botella			
LICORES	Chupito, copa, combinados Licores			

En sábado, domingos y festivos. Indique con qué frecuencia consume bebidas alcohólicas el fin de semana. Especifique también el tipo de bebida.

	RECIPIENTE (elegir uno)	**DIARIAMENTE** Número de veces: 0, 1, 2,...	**SEMANALMENTE** Número de veces: 0, 1, 2,...	**MENSUALMENTE** Número de veces: 0, 1, 2,...
CERVEZA	Vaso, lata, jarra, botella mediana, quinto			
VINO	Vaso, copa, botella			
LICORES	Chupito, copa, combinados Licores			

OTRAS SUSTANCIAS

Indique si consume alguna sustancia como las que se describen a continuación

MARIHUANA	❑ DIARIO	❑ SEMANAL	❑ OCASIONAL	❑ NUNCA
COCAÍNA	❑ DIARIO	❑ SEMANAL	❑ OCASIONAL	❑ NUNCA
HEROÍNA	❑ DIARIO	❑ SEMANAL	❑ OCASIONAL	❑ NUNCA
METADONA	❑ DIARIO	❑ SEMANAL	❑ OCASIONAL	❑ NUNCA
ANFETAMINAS	❑ DIARIO	❑ SEMANAL	❑ OCASIONAL	❑ NUNCA
EXTASIS	❑ DIARIO	❑ SEMANAL	❑ OCASIONAL	❑ NUNCA