

Environmental contexts of menopause in Spain: comparative results from recent research

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Abstract

Objective: This study had two main objectives: (1) to detect the differences in basic aspects of the reproductive aging process (age at menopause, menopausal symptoms, the medicalization of aging) among women from the region of Madrid, who at the time of the study were living in three different environmental contexts (rural, semiurban, and urban), and (2) to identify the main factors responsible for these differences.

Design: Data from two different research projects have been pooled for the DAMES project (Decisions At MENopause Study), and the Ecology of Reproductive Aging Project. The sample size was 1,142, women 45 to 55 years of age (103 rural, 744 semiurban, 295 urban).

Results: Probit analysis was used to estimate median age at natural menopause in the three contexts. Rural women have a later onset of menopause (rural, 52.07 y; semiurban, 51.9 y; urban, 51.23 y) and significantly higher levels of the symptoms related to declines in estrogen, eg, hot flashes (rural, 56%; semiurban, 43%; urban, 46%; $\chi^2 = 6.717$, $P = 0.035$) or loss of sexual desire (rural, 51%; semiurban, 44%; urban, 41%; $\chi^2 = 24.934$, $P = 0.001$). Conversely, urban women suffer more from symptoms related to stress, eg, impatience (rural, 34%; semiurban, 25%; urban, 45%; $\chi^2 = 41.328$, $P < 0.001$). The medicalization of menopause, measured in terms of both surgical menopause and the use of hormone therapy, is significantly higher in the urban population (surgical menopause: rural, 5.8%; semiurban, 8.7; urban, 10%; $\chi^2 = 16.009$, $P < 0.001$). Despite these differences, levels of postmenopausal hormone therapy use are still somewhat lower than in other West European and North American populations. Two different logistic regression analyses were carried out to identify (1) factors associated with differences in ovarian aging, measured through menopausal status, and (2) factors associated with prevalence of hot flashes with respect to ovarian aging. Parity, body mass index, age, environmental context, and, slightly less so, smoking, alcohol consumption, age at menarche, and marital status all contribute significantly or nearly significantly and independently to the explanation of differences found. For the likelihood of having hot flashes, environmental context, age, education, age at menarche, menopausal status, and postmenopausal hormone therapy use all have a significant or borderline significant effect.

Conclusions: Significant differences have been shown to exist in rural, semiurban and urban settings in the median age at menopause, in basic symptom frequency and type, and in the levels of medicalization of the process of reproductive aging. Within multivariate regression models, it has been shown that body mass index, age, and environmental context all contribute to differences in reproductive aging. The factors associated with ovarian aging and hot flashes are comparable to those in other industrialized populations, although standard interpretations should be expanded to include context-based realities, including (1) the higher levels of modernization of urban women that influence differential behavior with respect to risk factors at menopausal age; (2) the different ecological realities surrounding nutrition, physical activity, and social support that characterize women's period of development; and (3) the differential construction of their identity as women in terms of assertiveness, aesthetic perceptions, and the use of health services. Context does, indeed, matter.

Key Words: Spain – Age at menopause – Menopausal symptoms – Hot flashes – Postmenopausal hormone therapy – Ecological factors.

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Recent research on menopause has stemmed from work in the fields of biomedical and social sciences. Interest has been strongly encouraged by political and social advocates, who have promoted the idea that the menopausal transition is a difficult and often problematic period of change in women's lives. This has led to a more clinical way of dealing with menopause as a pathological condition often requiring preventive treatment, as opposed to

a more biocultural approach that considers menopause as an aspect of human aging and a useful predictive marker for risk of a variety of aging-related diseases and health problems.¹⁻⁵

Our understanding of the experience of menopause in Spain is still far from satisfactory. Some publications have brought to light socioeconomic, population, and timing differences in the median age at menopause and in the relative contributions of context, nutrition, body composition, and reproductive and genetic factors to this process.⁶⁻¹⁷

Considerable research is available on the use of hormone therapy,¹⁸⁻²⁴ on different health-related and biological aspects of menopause,²⁵⁻³¹ and on women's perceptions of menopause and their role in society.³²⁻³⁷ A recent study of Madrid women³⁸ has provided valuable insights into the symptomatology of menopause among Spanish women and the determinants of hormone therapy use in the country.

This report is based on results derived from two recent research projects. One of these is the Decisions at Menopause Study. Funded by the National Institutes of Health and directed by Carla Makhoul Obermeyer, this multisite study was designed to investigate the symptomatology of menopause and the factors affecting therapeutic decisions, in particular how health, sociocultural, and other factors are related to the burden of menopausal alternatives. The research for this project was conducted in four countries: Lebanon, Morocco, the United States, and Spain. Many of its initial findings have been reported in a series of recent publications.³⁸⁻⁴² A complete description of the project undertaken in Madrid can be found in Obermeyer et al.³⁸ The Ecology of Reproductive Aging project, directed by Cristina Bernis and funded by el Fondo de Investigación Sanitaria (Ministerio de Sanidad y Consumo), is the other source of data used in this report. This research, carried out among women living in rural and urban areas in the region of Madrid, was designed to detect and explain differences in ovarian aging in women whose life cycles developed in different ecological settings (always rural, always urban, and rural before reproductive age and then urban). Some results from this project have been published.^{6,9-13,17,43} Even though the research methods were not identical in these projects, the similarities are considerable and facilitate direct comparisons of results.

This report is based on a systematic comparison of the experience of menopause in environmentally distinct contexts (rural village, medium-size town, and large city), all of which are situated within a common cultural, political context, the region of Madrid. These comparisons are different from the more usual ones that look across different cultures.⁴⁴⁻⁴⁷ Here culture is the same, but the environmental context is quite different. This enables us to address a series of interconnected questions. How large are the observable differences and to what extent can they be explained by the different composition of each population? Can it be shown that the observed differences are related not only to the make-up of the populations studied but also to other factors transcending intrapopulation differences? If so, what explains these differences, and how do they affect the lives of women? If they do exist, they may be related to factors such as social networks, the prevailing medicalization of people's lives, and different

lifestyles that characterize these diverse populations, in particular those related to the balance of energy, to ovarian growth and maturation during the early stages of reproductive life, to reproductive behavior (family size, contraceptive use), and to the use of tobacco and alcohol.

MATERIALS AND METHODS

The different sites used for this study are all located in the province of Madrid. Colmenar de Oreja is a rural settlement located approximately 63 km southeast of the city of Madrid. According to the 2001 census, its population was just over 6,000 inhabitants. The great majority of its active population is involved in agricultural production or in services related to local life. Alcobendas is a suburb located just north of Madrid with a population of just over 93,000 persons. Most of its economically active population commutes to Madrid or is employed in the constellation of similar towns that together make up the greater Madrid area. The great growth of Alcobendas started in the 1960s and was a spillover from the growth spurt of the entire Madrid region. The final sample of women is taken from the city of Madrid, the capital of Spain and one of the major cities of Europe.

In all cases the detailed results of women 45 to 55 years of age are presented in this report. Sample size is 103 in Colmenar de Oreja, 744 in Alcobendas, and 295 in Madrid.

In the case of women from the city of Madrid, where field work was carried out between October 2002 and March 2003, a random sample taken from the continuously updated census lists (*padrón municipal*) was used. The original sample and substitutions were stratified by municipal districts, with the resulting group of women evenly distributed throughout the city. Women were sent a letter and subsequently contacted by phone. Interviewers then set up contacts and obtained informed consent from each woman who agreed to be interviewed. The response rate among contacted women was 46%, with most refusals due to a lack of time. The socioeconomic and demographic structure of the resulting sample is similar in most ways to that of Madrid as a whole except in education. Our sample had more women with university degrees (28% in sample, 22% in all of Madrid), likely reflecting a greater willingness of more educated women to talk about menopause and possibly greater time constraints of less educated women. In any case, the Madrid sample includes women of all social strata and educational attainment.^{48,49}

The strategy for the databases in Alcobendas and Colmenar de Oreja was somewhat different. In Alcobendas, an agreement was signed between the Madrid regional government, the municipal government of Alcobendas, and the Universidad Autónoma de Madrid. All women aged 45 to 65 were invited to participate in a free public health program of gynecological check-ups between 1996 and 1998. This program included mammograms, scans, gynecological checkups, normal and hormonal blood tests, clinical histories, anthropometry, and nutritional surveys. The women were taken from Alcobendas to the Cantoblanco Hospital (near the university) in a bus provided free of charge by the municipal government. These circumstances led to women of lower socioeconomic levels being overrepresented in the

sample. A sample of 8% to 10% of the total population in the target age group was used. Women participating in the health program were approached about participating in this study as they came in for the checkups. Participation rates in the reproductive health survey itself were very high (98%).

The sample from Colmenar was gathered between 1997 and 1998. This project received the support of the municipal government, which provided its own health clinics for the study. A nurse accompanied the research team to draw blood, although these women did not receive mammograms or gynecological checkups, contrary to the situation in Alcobendas. The sample size in Colmenar de Oreja represents about 6% of women 45 to 54 years of age in the local population. The participation rate in the reproductive health survey was 100% of women participating in the testing program. All participants signed informed consent letters to participate in the research project. A total of 1,037 women between 45 and 65 years of age made up our study group in Alcobendas, and another 189 were enrolled in Colmenar de Oreja. In this present study, only women 45 to 55 years of age were included. In both Alcobendas and in Colmenar de Oreja, the different measures of reproductive health showed considerable internal consistency, thus increasing our confidence in the reliability of the way the samples were generated and in their size. More detailed methodological information can be found in papers by Custodio and Barroso.^{6,8,11}

The differences in sampling techniques do not prevent a systematic comparative analysis like the one proposed here but should be kept in mind when interpreting some of the findings. The instruments used in both studies are similar. Women were asked for demographic and socioeconomic information, data on their health (including self-assessment), their reproductive histories, lifestyle questions, a symptom checklist, and the use of postmenopausal hormone therapy (PHT) or other types of therapies for menopause. The checklist of symptoms differed by research project, although in both cases, symptoms directly related to hormone depletion were embedded within a list of symptoms related more generally to aging. In this report, only symptoms common to both projects are used.

Quantifiable categorical response variables were analyzed statistically using SPSS 14 (SPSS Inc, Chicago, IL), first through cross-tabulations to explore associations with statistical tests (mainly χ^2) to assess the strength and significance of associations. Logistic regression techniques were also used to ascertain the degree to which the effect of environmental context is present within multivariate models designed to explain variability in ovarian aging (menopausal status) and in vasomotor symptoms (hot flashes).

RESULTS

Table 1 shows the social and demographic characteristics of respondents. Mean age of sample groups is generally similar across all sites, although it was slightly older in the city of Madrid. Significant differences emerge with marital status, education, and occupation, suggesting very traditional behavior patterns in the rural population, intermediate ones in the midsize town, and more modern ones in the capital of Madrid. Educational attainment among women in Madrid is

many times higher than it is at the other sites, with the lowest levels in rural Colmenar, where nearly half the women have not finished their primary education, as opposed to only 8% in the Madrid sample. Equally strong are the disparities among the more highly educated segments of the population, with 28% of the Madrid group having a university degree as opposed to 3% in Alcobendas and none in Colmenar. Differences by occupation and work status mirror those found in educational attainment. The occupational structure found in Alcobendas is closer to that in rural areas than to that in Madrid. Activity levels are more than twice as high in Madrid than they are in Colmenar de Oreja. These disparities reflect the different sampling techniques mentioned earlier as well as the general structures of the populations at the three sites.

Table 2 shows health and reproduction data taken from the three sites included in this report. Once again, significant disparities appear. The incidence of obesity, highest in the town of Alcobendas and lowest in Madrid, differs by a factor of more than 3. Women with a normal body mass index (BMI) are more than twice as prevalent in the Madrid sample as elsewhere. Alcohol consumption is also significantly more prevalent in Madrid (a ratio of 2.8:1), as are smoking (3.9:1) and exercise (3.1:1, based on light exercise). Not surprisingly, women in the large city are healthier. They are more likely to engage in certain lifestyle activities beneficial to health, although they also show a higher incidence of smoking and alcohol consumption. The worst health indicators are found precisely in the midsize town of Alcobendas. These results are also mirrored in the way women rate their own health, with the highest levels of good-excellent among Madrid women and the lowest among

TABLE 1. Demographic and social characteristics of different studies

Characteristic	Context			P ^a
	Village	Town	City	
	Colmenar de Oreja (n = 103)	Alcobendas (n = 744)	Madrid (n = 295)	
Age, y				
44-46	17.9	22.3	14.0	<0.001
47-49	34.6	31.1	31.8	
50-52	28.9	24.3	28.1	
53-56	18.5	22.3	26.0	
Marital status				
Never married	1.1	5.8	19.5	<0.001
Married	90.0	87.4	70.9	
Widowed	4.2	4.9	3.4	
Divorced/separated	4.7	1.9	6.1	
Education				
Primary incomplete	47.1	37.1	8.0	<0.001
Primary complete	48.0	49.8	21.0	
Secondary	4.9	10.1	43.0	
Higher education	0.0	3.0	28.0	
Occupation/work status				
Semi-/unskilled	83.7	81.9	24.7	<0.001
Clerical/sales	6.5	11.2	30.5	
Skilled	8.7	4.5	13.2	
Professional	1.1	2.4	31.6	

^aPearson χ^2 .

TABLE 2. Health and reproduction data

	Context			<i>P</i> ^a
	Village	Town	City	
	Colmenar de Oreja (n = 103)	Alcobendas (n = 744)	Madrid (n = 295)	
Body mass index (CDC categories)				
<25	26.2	22.3	58.2	<0.001
25.0-29.9	47.6	44.6	33.6	
30+	26.1	33.1	8.2	
Regular alcohol consumption				
Yes	29.1	22.3	61.6	<0.001
Smoking				
Yes	8.7	18.27	33.9	<0.001
Exercise				
Yes	49.5	25.67		<i>b</i>
Light			79.3	<i>b</i>
Heavy			33.7	<i>b</i>
Rating of health				
Poor	8.8	11.0	2.7	<0.001
Fair	8.8	10.6	12.3	
Good-excellent	82.4	78.4	85.0	
Age at menarche, y				
<12	10.8	17.9	20.8	<0.001
12-13	75.5	69.1	54.3	
>13	13.7	13.0	24.9	
Mean	13.15	12.97	12.62	
Children ever born				
Mean	2.57	2.52	1.69	<0.001
Menopausal status				
Premenopausal	58.2	51.7	47.4	<0.01
Perimenopausal	14.6	12.0	10.8	
Postmenopausal	27.2	36.3	41.8	
Total	100.0	100.0	100.0	
Surgical menopause	5.8	8.7	10.0	
Age at natural menopause, y				
Median	52.07	51.90	51.23	<i>b</i>

CDC, Centers for Disease Control and Prevention.

^aPearson χ^2 .

^bSignificance not estimated.

Alcobendas women. These differences in self-assessed health, however, are smaller than the ones observed with the other, more direct, indicators of health-related lifestyles.

Significant differences exist for reproduction and health indicators. Age at menarche is lower among city women than in women in the countryside, likely as a result of disparities in levels of nutrition and physical labor during their growth and development. Fertility among Madrid women (1.69 children) is 50% lower than that among rural (2.57 children) or suburban women (2.52 children) because of both the greater incidence of marriage among women in Alcobendas and in Colmenar and the lower level of marital fertility in urban areas (married women in the Madrid sample have only 2.05 children).

Women have been classified by menopausal status, distinguishing those whose menopause was induced surgically. Again, significant differences by context emerge. Surgical menopause was nearly twice as frequent among Madrid women (10.0%) as among those living in rural areas (5.8%), with levels in suburban Alcobendas in between (8.7%). For women with natural menopause, more than 40%

are postmenopausal in Madrid, as opposed to nearly 27.2% in rural Colmenar, thus suggesting earlier ovarian aging in the city sample. This result is borne out by the median age at menopause (probit estimates), which is almost 1 year older among rural women (52.07 y) than it is among *madrileñas* (51.23 y). In the Madrid sample, if current hormone therapy users are excluded, the median age at menopause is slightly older at 51.7 years.⁴²

Symptom reporting in different environmental contexts is displayed in Table 3, which has been divided into two sections: all women and women not currently using PHT.

TABLE 3. Symptom frequencies^a

	Context			<i>P</i> ^b
	Village	Town	City	
	Colmenar de Oreja (n = 103)	Alcobendas (n = 744)	Madrid (n = 295)	
All women				
Vasomotor symptoms				
Hot flashes	56	43	46	<0.05
Night sweats	35	23	34	
Emotional/mental symptoms				
Nervousness/anxiety	57	45	50	<0.05
Depression	28	22	26	
Irritability/impatience	34	25	45	<0.001
Cardiovascular symptoms				
Palpitations	23	22	28	
Shortness of breath	14	13	21	<0.01
Sexual symptoms				
Pain with intercourse	16	20	11	<0.001
Loss of sexual desire	51	44	41	<0.001
Other symptoms				
Dizziness	32	26	25	
Joint pain	64	68	57	<0.01
Weight gain	50	64	51	<0.01
Sleep disturbance	23	35	48	<0.001
Fatigue/weakness	30	23	42	<0.001
Headaches	57	40	48	<0.05
Women not currently using PHT				
Vasomotor symptoms				
Hot flashes	54	43	46	
Night sweats	24	35	33	
Emotional/mental symptoms				
Nervousness/anxiety	57	46	49	
Depression	28	23	26	
Irritability/impatience	33	25	44	<0.001
Cardiovascular symptoms				
Palpitations	23	25	27	
Shortness of breath	13	13	21	<0.01
Sexual symptoms				
Pain with intercourse	16	19	12	<0.001
Loss of sexual desire	50	44	39	<0.001
Other symptoms				
Dizziness	33	25	25	
Joint pain	64	67	56	<0.01
Weight gain	50	65	50	<0.01
Sleep disturbance	24	35	48	<0.001
Fatigue/weakness	29	23	41	<0.001
Headaches	44	40	47	

PHT, postmenopausal hormone therapy.

^aPercentage of women who have experienced a given symptom in the previous month.

^bPearson χ^2 .

TABLE 4. Hormone therapy by environmental context: Spain^a

PHT	Context			P ^b
	Village	Town	City	
	Colmenar de Oreja	Alcobendas	Madrid	
Use				
Never	97.0	90.1	82.5	<0.001
Previously	1.0	4.2	7.5	
Currently	2.0	5.7	9.9	
Prescription				
Yes	2.5	12.8	29.1	<0.001

PHT, postmenopausal hormone therapy.

^aLevels of PHT prescription in Colmenar and Alcobendas refer to prescriptions at their most recent visit to a specialist. In Madrid, it refers to PHT prescription at any time. Percentage of women in each category is shown.

^bPearson χ^2 .

A tapestry of significant disparities emerges along with certain common factors. For all women, joint pains are the symptom most frequently reported, whereas pain with intercourse and shortness of breath are the least reported. More noteworthy are the generally statistically significant disparities, with often starkly different frequencies for some symptoms. For example, impatience is reported as a symptom by 25% of Alcobendas women, as opposed to 45% of Madrid women. There are spreads of 19 and 17 percentage points between the highest and lowest levels of fatigue and headaches, respectively. For 6 of the 14 symptoms included in the table, the most frequent reporting

is 40% to 80% higher than the least. Hot flashes are reported by 56% of Colmenar women but only by 43% of suburban Alcobendas women. Certain more general patterns emerge as well. Madrid women show relatively high frequencies of some emotional and all cardiovascular symptoms but low frequencies of sexual and most of the other symptoms. Sexual symptoms tend to be more frequent in suburban and rural contexts, as opposed to cardiovascular symptoms, which are reported less frequently. Weight gain, joint pains, and sleep disturbance are more frequent among suburban women than among women at other sites.

Symptom frequencies for women not currently using PHT are shown in Table 3. These estimates have been included to better understand the potentially confounding effects of PHT on the symptomatology related to menopause. The data in the table show that the changes in symptom frequencies are relatively minor, as are changes in the significance of the associations. Apart from hot flashes, where the association with context is no longer significant, for other groups of symptoms there is little change. Among Madrid women, there is a higher prevalence of irritability, cardiovascular symptoms, sleep disturbance, fatigue, and headaches. For rural women, sexual symptoms are more prevalent, as are dizziness, nervousness, and hot flashes. For suburban women, the incidence of weight gain and joint pains is higher than in other contexts.

PHT use is much more prevalent in Madrid than it is in Alcobendas, whereas in rural Colmenar, it is almost non-existent (Table 4). Of the Madrid women, 17.4% are currently

TABLE 5. Social, health, and aging covariates of symptoms during menopause^a

Symptoms	Covariates																	
	Health status			Age			Menopausal status			Partner/marital status			Occupational/employment status			BMI		
	V	T	C	V	T	C	V	T	C	V	T	C	V	T	C	V	T	C
Vasomotor symptoms																		
Hot flashes		<0.001		<0.05	<0.001	<0.01	<0.001	<0.001	<0.001	<0.05								<0.05
Night sweats						<0.01				<0.05								
Emotional/mental symptoms																		
Nervousness	<0.01	<0.001													<0.01			
Depression	<0.01	<0.001	<0.001															
Cardiovascular symptoms																		
Palpitations	<0.001	<0.001										<0.001		<0.001				
Shortness of breath	<0.001	<0.001								<0.01	<0.01		<0.05					<0.01
Genitourinary symptoms																		
Pain with intercourse	<0.05	<0.05		<0.01			<0.001	<0.01		<0.001								
Loss of sexual desire	<0.01		<0.01			<0.05	<0.05	<0.05	<0.05	<0.001	<0.01							
Other symptoms																		
Dizziness		<0.001	<0.001				<0.05		<0.01				<0.01					<0.05
Joint pain	<0.05	<0.001	<0.001				<0.05						<0.01					
Weight gain			<0.001															<0.001
Sleep disturbance			<0.001			<0.001												
Fatigue/weakness	<0.05	<0.001	<0.001							<0.001								

BMI, body mass index; V, village of Colmenar de Oreja; T, town of Alcobendas; C, city of Madrid.

^aPearson χ^2 estimates (P values) for each environmental context separately. Occupational/employment status includes the following categories: semi-skilled, clerical and sales; skilled, professional and managerial; and not employed. Partner/marital status is a combination of marital status and living with a husband/partner.

using or have previously used PHT, as opposed to 9.9% in Alcobendas and only 3% in Colmenar. Similar disparities among sites were found for prescription of PHT. The associations for these variables are highly significant.

The basic covariates of symptom frequency are reported in Table 5, which shows results of χ^2 tests of association for each environmental context separately. This table shows that there are few relevant covariates whose effects hold across all sites, with the exception of vasomotor symptoms, which are strongly linked to age and menopausal status, with the perimenopausal and surgical menopausal periods being associated with the highest frequency of hot flashes. Sexual symptoms also show a number of significant covariates, although none of them holds in all sites. Partner status is linked to sexual symptoms only in Madrid, where having a partner increases the incidence of these sort of symptoms. Emotional symptoms are largely unrelated to any of the covariates used. Similar tests were also carried out for the bivariate effects of smoking and alcohol on different symptom frequencies in different contexts (not shown), with no relevant results emerging.

Two further regularities emerge from this table of covariates that warrant mention. First, in rural Colmenar, there are fewer links and their significance is lower. This pattern is similar throughout. The prevalence of significant links shown in this table is more than twice as high in the Madrid sample (40%) as elsewhere (19% or 17% of possible links are significant). These covariates are fairly useful predictors of symptoms in Madrid but not other sites. Second, unsurprisingly, women's self-assessed health status is linked to a number of menopausal symptoms, with higher levels of satisfaction indicating lower frequencies of symptoms. Here there are considerable differences across the different sites. Symptom frequency seems to be largely unrelated to perceived health status in Colmenar but is strongly linked to perceived health in Alcobendas and especially Madrid.

To evaluate the relative contribution of environmental context to the experience of menopause, we have specified multivariate models for two key variables: the likelihood that a woman is postmenopausal (only natural menopause) and the incidence of hot flashes. In both cases logistic regression techniques were used with the pooled data set. The explanatory variables introduced into both models were based either on theoretical considerations or on promising bivariate links to the dependent variable. The following explanatory variables were introduced into the model for menopausal status: environmental context, age (four groups), children ever born (four categories), education (four categories), BMI (three Centers for Disease Control and Prevention categories), regular alcohol consumption (yes/no), smoking (current, yes/no), age at menarche (three categories), and marital status (currently married/not married). The same variables were included in the model for hot flashes as well as menopausal status (premenopausal, natural menopause, and surgical menopause) and PHT use (never, previous, and current). Both models are relatively complete because they include most of the factors considered in the literature to be of importance for the two dependent variables.

In both models most of the explanatory variables are significant, although levels are often not very high. With respect to menopausal status (Table 6), age has a highly

significant and expected effect, as does the number of children ever born (with childless women far more likely to be naturally menopausal). BMI also has a strong and significant effect, with overweight and obese women less likely to be menopausal than women of normal weight. Alcohol consumption diminishes the likelihood of being postmenopausal, and smoking increases it. Women who started menstruating earlier are more likely to be postmenopausal, and women not currently married are less likely. In these last cases, the effect shown in the model is borderline significant. Education has no importance for menopausal status. Within the context of this full model, environmental context continues to have a noticeable and significant effect on menopausal status.

With respect to hot flashes (Table 7), the women most likely to have experienced this symptom are postmenopausal (surgical or natural), 50 to 52 years of age, with low levels of education, obesity, and no children. These women started menstruating earlier and took PHT previously but were no longer using it. Many of these effects are statistically significant. Environmental context has a significant effect on the likelihood of experiencing hot flashes.

From our viewpoint, the most interesting result from this analysis is the fact that in both models, environmental

TABLE 6. Likelihood of being postmenopausal^a

	β	SE	Sig.	Exp(B)
Context				
Colmenar de Oreja (reference)			0.139	
Alcobendas	0.497	0.301	0.099	1.644
Madrid	0.720	0.366	0.049	2.055
Age, y				
45-46 (reference)			0.000	
47-49	1.158	0.350	0.001	3.185
50-52	2.655	0.340	0.000	14.219
53-55	3.761	0.369	0.000	42.984
Children ever born				
0 (reference)			0.008	
1-2	-1.026	0.325	0.002	0.358
3	-0.624	0.345	0.071	0.536
4+	-0.770	0.355	0.030	0.463
Education				
Primary incomplete (reference)			0.382	
Primary complete	-0.299	0.187	0.109	0.742
Secondary	-0.243	0.273	0.373	0.784
University	-0.441	0.366	0.229	0.644
BMI				
<25 (reference)			0.008	
25.1-29.9	-0.584	0.191	0.002	0.558
≥ 30	-0.490	0.232	0.035	0.612
Alcohol				
(Reference = no)	-0.327	0.182	0.072	0.721
Smoking				
(Reference = no)	0.374	0.204	0.068	1.453
Menarche				
<12 y (reference)			0.161	
12-13 y	-0.353	0.213	0.097	0.702
>13 y	-0.408	0.225	0.070	0.665
Marital status				
(Reference = married/partner)	-0.424	0.249	0.088	0.654
Constant	-1.626	0.575	0.005	0.197

Sig., significance; BMI, body mass index.

^aOnly natural menopause; surgical menopause excluded. Estimation technique: logistic regression; contrast method: indicator. Cox and Snell $R^2 = 0.250$; Nagelkerke $R^2 = 0.349$. N = 1,019.

TABLE 7. Likelihood of experiencing hot flashes in previous month^a

	β	SE	Sig.	Exp(β)
Context				
Colmenar de Oreja (reference)			0.008	
Alcobendas	-0.651	0.234	0.005	0.522
Madrid	-0.300	0.295	0.308	0.741
Age, y				
45-46 (reference)			0.000	
47-49	0.810	0.218	0.000	2.249
50-52	1.178	0.226	0.000	3.248
53-55	0.862	0.265	0.001	2.368
Children ever born				
0 (reference)			0.552	
1-2	-0.363	0.284	0.200	0.695
3	-0.403	0.303	0.183	0.668
4	-0.283	0.309	0.360	0.753
Education				
Primary incomplete (reference)			0.057	
Primary complete	-0.393	0.157	0.012	0.675
Secondary	-0.477	0.225	0.034	0.620
University	-0.433	0.302	0.151	0.648
BMI				
<25 (reference)			0.186	
25.1-29.9	0.097	0.158	0.540	1.102
≥ 30	0.348	0.194	0.074	1.416
Alcohol				
(Reference = no)	-0.234	0.149	0.115	0.791
Smoking				
(Reference = no)	-0.271	0.172	0.115	0.763
Menarche				
<12 y (reference)			0.008	
12-13 y	-0.100	0.180	0.597	0.905
>13 y	-0.503	0.191	0.009	0.605
Marital status				
(Reference = married/partner)	-0.203	0.209	0.331	0.817
Menopausal status				
Pre-/perimenopausal (reference)			0.000	
Postmenopausal (natural)	0.699	0.166	0.000	2.012
Postmenopausal (surgical)	0.348	0.241	0.150	1.416
PHT use				
Never (reference)			0.001	
Previous	1.151	0.320	0.000	3.162
Current	-0.099	0.325	0.761	0.906
Constant	0.044	0.445	0.922	1.045

Sig., significance; BMI, body mass index.

^aAll women included. Estimation technique: logistic regression; contrast method: indicator. Cox and Snell $R^2 = 0.125$; Nagelkerke $R^2 = 0.167$. $N = 1,148$.

context continues to have a noticeable and often significant effect, even when placed in a full multivariate model.

DISCUSSION

The results reported here correspond to three sites, all situated in a single province, Madrid. All of them share a common culture, language, schooling system, health system, and history. Some of them have experienced rapid population growth in recent decades, but most of this growth was due to migration from other areas of Spain, often central Spain. The shared values and contexts are evident, and this led us to expect important similarities in the way menopause was experienced, at least insofar as this experience is influenced by cultural realities. The key element of differentiation is the environmental context, including a relatively large agricultural village, a midsize town located within a

larger urban area, and a major city. Each of these sites reflects different lifestyles, economic realities, partner relationships, and a host of other variables. It can be argued that these contexts themselves reflect different sociocultural realities and that this is the real discriminating element for the experience of menopause. The empirical results reported here come strongly on the side of the heterogeneity of the experience of menopause and form a cautionary tale about the inherent limits of all generalizations.

Important disparities have emerged everywhere. Some of these may have been enhanced by the ways in which the samples were gathered at the different sites. Even so, one of the main results of this study concerns the inherent heterogeneity affecting the experience of menopause. At first glimpse, the big city population of Madrid has far more modern socioeconomic characteristics than those of the other two populations. The incidence of marriage is much lower, education is far higher, the participation of women in the labor market is appreciable, fertility is much lower, and being overweight is a far smaller problem, although smoking and alcohol consumption are higher. In some ways Madrid women seem to be further along the path to modernity in Spain, at least in the way it is commonly understood in Europe, than women living in the suburban town or the rural village. Predicting the path of change of contemporary society is, of course, difficult, but the distance separating Madrid women from women in other parts of Europe is clearly much less than for the women from the other sites.

The results shed light on important differences in the pace of reproductive aging and in the symptoms or groups of symptoms experienced. All this exists despite a shared common cultural context and close geographic proximity. The pace of reproductive aging (age at natural menopause and menopausal status) is faster among women in Madrid, much slower for women from rural Colmenar, with suburban women from Alcobendas in between. When excluding current users of PHT in the Madrid sample, as has been done in other studies, age at menopause increases.⁴² Even then, however, menopause continues to start earlier in Madrid women than women from the other two sites, indicating that the differences observed are not related to PHT use. The results indicating that more obese women tend to undergo menopause later are in accord with findings of other investigators.^{42,44,45,51,52}

In agreement with other studies, joint pain is the most frequently mentioned symptom at all the sites. For perimenopausal women, joint pain has been found to be the main problem affecting the quality of women's lives, more so than the vasomotor symptoms so often mentioned in the literature.⁵³ This result should encourage us to think carefully about the adequacy of health services for middle-aged women, which tend to concentrate on the short- and long-term consequences of estrogen depletion.

Rural women in Colmenar have the highest frequencies of 7 of the 15 symptoms used in this report, whereas urban women have the highest frequency of 5 symptoms. Among women in Madrid of menopausal age, the frequency of some emotional and all cardiovascular symptoms is relatively high and that of sexual and most other symptoms is relatively low. Although the most frequent symptoms among Madrid women are related to stress, those of suburban and rural

women tend to be more related to estrogen depletion affecting hot flashes and vaginal symptoms. When controlling for the current use of hormone therapy, the cross-site differences in most symptoms have been shown to persist, and, with the exception of vasomotor symptoms, significance levels are maintained.

PHT use is generally fairly low, a result that is not dissimilar to the levels reported in other studies.^{18,22,24} The most noticeable aspect of these data is, once again, the very strong cross-site differences. Current use among Madrid women is four times higher than use in women from Colmenar, with the range of Spanish experience extending from levels somewhat lower to those found among women in Beirut (15% current use) or Massachusetts (20%) to levels even lower than those among women in Morocco.³⁹⁻⁴¹ Much the same holds for PHT prescription, although here the disparities are even greater. Although levels among Madrid women are similar to those found in the United States (30% Madrid, 33% Massachusetts), for the rural site, prescription is almost nonexistent.

The dates of the different studies whose results are reported here may have contributed to lessening of the observed differences in PHT use. The research on both Colmenar and Alcobendas was carried out before the Women's Health Initiative clinical results came to light, whereas the Madrid field work took place between 4 and 9 months after these results were published (October 2002 and March 2003). If these had a dampening effect on the use of PHT in Spain, as they seem to have had elsewhere, this would have lowered current use in Madrid in our study and thus tended to understate the cross-site differences. In the Madrid sample itself, there is some indication of a decrease in PHT use and prescription after publication of the Women's Health Initiative results: current use by women interviewed between October and December 2002 was 10.3% as opposed to 9.5% among women interviewed in February and March 2003, and PHT prescription for menopause decreased from 23% to 21%.³⁸

Different results show that the Madrid population is considerably more medicalized than the populations at the other sites and that women deal with their experience of menopause in a more rational, conscious manner. (1) There is a greater incidence of significant covariates of symptoms reported among the women of Madrid. (2) When women are asked to assess their own health status, their experience of symptoms is consistently and significantly linked to their health in Madrid. These links also appear, although somewhat less so, in Alcobendas, as opposed to the rural context, where almost no significant covariates emerge. (3) Surgical menopause is twice as prevalent among Madrid women as it is in rural areas (10% and 5.8%, respectively). Here levels of surgical menopause found in Spain fit conveniently between the 11% of surgically menopausal women in highly medicalized Beirut and the 16% in Massachusetts and the 2% in Rabat.³⁹⁻⁴¹ (4) The disparities reported earlier in both PHT use and prescription is yet another indication of this. All these points offer persuasive evidence of the existence of a much more medicalized life in Madrid than in the other contexts studied. Even in Madrid, however, levels of medicalization seem to be lower than those found in other countries, as suggested by the differences between PHT use

and prescription (with levels of PHT prescription similar to those in other countries while use is much lower).⁴¹ These results can be interpreted in terms of the traditional reticence that continues to exist in Spanish society with respect to the medical establishment as a whole.

In the course of this report, considerable evidence has been presented regarding the cross-site disparities in the experience of menopause in Spain. This is in itself an important result because it underscores the limits inherent in any generalization based on limited samples. Yet it also encourages us to probe further. Are these disparities the product of the important social, economic, demographic, and biological processes characterizing the populations studied, or is there more? Stated a bit differently, what does environmental context really mean and how does it influence behavior? The make up of the women at the different sites is sufficiently diverse to suggest that this may be a key reason why symptom frequencies and their covariates, as well as therapeutic options, are so different. Does composition explain all the observed differences? This is a large issue, one that can only be partially addressed in this report. Its importance is unquestionable because it affects any type of comparative analysis, be it intracultural and across site like this one or intercultural.

It is unquestionable that context matters even when controlling for other intersite differences. Taking women who have completed their primary education as an example, hot flashes are experienced by 55% of the women in Colmenar de Oreja, by 37.7% of those in Alcobendas, and by 51.9% of those in Madrid (the overall frequencies are 56%, 43%, and 46%, respectively). When looking only at overweight and obese women, hot flashes are experienced by 58% of women in Colmenar, by 45% of women in Alcobendas, and by 49% in Madrid. The cross-site differences have been found to persist even when controlling for a wide range potential health status and socioeconomic confounders. This issue was addressed directly and more completely by means of the multivariate models presented in Tables 6 and 7. In both cases, even when controlling for a large set of independent variables, the importance of context remained significant.

These tests suggest that indeed environmental context is important, and this is not just the result of the social, economic, and demographic disparities existing at each site. There is something else at work here. What is it? Explaining the impact of environment beyond the natural socioeconomic realities is not a simple task. But certain structural differences exist that help further our understanding.

The way in which women manage and experience menopause is conditioned by cultural and biological factors that are often related. Women with high levels of adiposity (the result of dietary factors) tend to have later menopause than women who are thin.^{44,45,52,54} This link has been detected separately in our suburban population (Alcobendas) and our urban population (Madrid).^{8,42} Our results showing the links between adiposity and the prevalence of vasomotor symptoms are present not only in the semiurban population (Table 4), but also when the data from the three sites have been pooled for the logistic regression shown in Table 7. Obese women show a probability of hot flashes that is 1.4 times higher than that of women with a BMI <25 ($P < 0.074$). These results are similar to those recently found

in other populations⁵⁵ and coincide with those found earlier for Alcobendas alone.^{6,8} A younger age at menopause and a lower frequency of vasomotor symptoms among Madrid women is due, at least in part, to a lower BMI, itself clearly linked to nutritional behavior, physical activity, aesthetic perceptions, smoking, and higher levels of work-related stress, all of which are also directly linked to reproductive aging and vasomotor symptoms. Smoking itself, far more prevalent in Madrid than at the other sites, has been identified as a risk factor for early menopause.^{42,56,57}

The cultural determinants of the contexts studied here show important subtleties that go beyond socioeconomic levels or rural/urban differences. These are related to the interaction between biology and culture materialized in the lifestyles and perceptions mentioned earlier, including hypercaloric diets, sedentary lifestyles, alcohol consumption, and smoking. Linked to these factors is gender relations, insofar as they define the social and economic independence of women and the way in which they perceive their own identity, their health, and how feminine stereotypes shape their lives.^{58,59} All these factors have been suggested as important aspects not only in determining the way in which menopause is lived by women but also affecting the frequency of different symptoms. More research is needed in this area, especially with respect to identifying potentially useful indicators for assessing just how gender can affect reproductive aging and the prevalence and intensity of associated symptoms.

Somewhat beyond the confines of the data presented here, the following social and cultural contexts of the populations studied may help explain some of the differences observed between rural, suburban, and urban women in Spain.

1. The family responsibilities of women related to the care of kin who are ill, disabled, or elderly tend to increase the stress levels of women. This is especially so with women who have jobs outside the home, a situation much more frequent for women in the urban (Madrid) sample.
2. The influence of the media on women in different economic and personal situations can be enormous, with respect not only to the way in which they manage their menopause but also to their self-esteem. Frequently, menopause is presented in the media as a negative experience in need of medical treatment.⁶⁰ Some authors have suggested that women in more traditional contexts, who are more dependent on their husbands or partners for their living standards, whose social and family values are more clearly related to their reproductive capacity, tend to be those who have a more negative menopause experience and are more sensitive to the messages coming from the media.^{59,60}
3. Social networks have traditionally been denser and more family oriented in Spain and in other southern European contexts than in areas of central and northern Europe.⁶¹ In a country such as Spain, the density of social networks will tend to be stronger in smaller areas and weaker in larger ones and will lead to greater levels of shared experience. Related to this, different environmental contexts also bring with them different lifestyles, different levels of stress, and different intensities in the flow of information. All of these

contribute to different value systems with respect to the role of women within the family and society, to their social and economic autonomy, and ultimately to just how conservative rural societies are in comparison to urban areas. Perhaps the major differences found in parity and its significant association with the probability of being postmenopausal is related to stress differences. Other investigators have also found that nulliparous and low parity women are at higher risk of earlier menopause.^{42,53,62}

4. The degree of medicalization of everyday life should be greater in larger contexts, where the implementation of health services is much greater. In local communities, the importance of medical providers is much less, even for the most educated segments of the population. There may also be a different mentality at work in large cities, more prone to depersonalizing therapeutic options.

All these points refer to different aspects of local culture and remind us that this report describes what is ultimately, at least in part, a cultural comparison. As happens with culture and society, there is also a biological dimension to the experience of menopause that may differ by environmental context. The influence of BMI on the likelihood of being postmenopausal or of having hot flashes reminds us of this, because BMI is determined by the interaction between biology and behavior. The specific ways in which these different but related factors influence the results presented here is not as clear. Exploring this issue further leads us into a sea of uncertainties. What is clear from the results presented here is that environment does indeed matter.

CONCLUSION

Our initial hypothesis based on the expected similarity in the experience of menopause at these three sites has been disproven. Significant differences have been shown to exist in rural, semiurban, and urban settings in the median age at menopause, in basic symptom frequency and type, and in the levels of medicalization of the process of reproductive aging. Within multivariate regression models, it has been shown that BMI, age, and environmental context all contribute to differences in reproductive aging. Rural women tend to have higher symptom frequencies, have greater problems with their weight, and are less medicalized than urban women. Suburban women tend to have a situation somewhere between rural and urban, with a slight tendency to be more like women in Madrid.

The interpretation of these differences is based on the following points: (1) the greater degree of modernization of urban women, which brings with it different behavior patterns affecting ages at menopause; and (2) the different environmental circumstances (especially related to nutrition, physical activity, and social support) that characterize periods of development. These disparities are best understood as the result of the interaction among biological, ecological, and behavioral factors influencing women both earlier in life and during the change of life that they are experiencing now.

Future research would do well to include indicators that enable us to evaluate how women's identity is constructed and how differences are forged in decision-making abilities, assertiveness, aesthetic perceptions, and the use of health

services. All these are related to the gender-specific niches that women occupy in different societies and may help us achieve a more thorough understanding of the disparities that have been found in reproductive aging in different populations.

REFERENCES

- Sievert LL. Menopause as a measure of population health: an overview. *Am J Hum Biol* 2001;13:429-433.
- Leidy Sievert L. Aging and reproductive senescence. In: Ellison PT, ed. *Reproductive Ecology and Human Evolution*. New York, NY: Aldine Gruyter, 2001:267-292.
- Lock M, Kaufert P. Menopause, local biologies, and cultures of aging. *Am J Hum Biol* 2001;13:494-504.
- te Velde ER, Dorland M, Boekmans F. Age at menopause as a marker of reproductive aging. *Maturitas* 1998;30:119-125.
- World Health Organization. *Research on the Menopause in the 1990s*. Geneva, Switzerland: World Health Organization, 1996. WHO Technical Report No. 886.
- Barroso A. *Envejecimiento reproductor en mujeres españolas desde una perspectiva ecológica y de ciclo vital*. [dissertation]. Madrid, Spain: Universidad Autónoma de Madrid; 2003.
- Barroso A, González B. Síntomas vasomotores y variables biológicas: ¿son diferentes las mujeres asintomáticas? In: Caro L, Rodríguez H, Sánchez E, López B, Blanco M, eds. *Tendencias actuales de la investigación en la Antropología Física Española*. León, Spain: Universidad de León, 2000:529-535.
- Barroso A, Bernis C, Montero P, Arias S, González MB. Envejecimiento ovárico, composición corporal y cambios en peso en mujeres de Alcobendas. In: Varela T, ed. *Investigaciones en biodiversidad humana*. Santiago de Compostela, Spain: Universidad de Santiago de Compostela, 2000:591-597.
- Bernis C. Cambio ambiental reciente y sus consecuencias sobre los procesos de envejecimiento reproductor en las mujeres. *Rev Español Antropol Biol* 2001;22:89-95.
- Bernis C. Ecología del envejecimiento reproductor. In: Bernis C, López R, Prado C, Sebastián J, eds. *La salud de la mujer en el umbral del siglo XXI Salud y género. Instituto Universitario de Estudios de la Mujer*. Madrid, Spain: Universidad Autónoma de Madrid, 2001:129-143.
- Custodio E, Bernis C, Barroso A, Montero P, Varea C. Riesgo cardiovascular en mujeres españolas de 45 a 65 años: el papel de la ferritina. *Anthropos* 2003;4:1-15.
- Montero P, Bernis C, Varea C, Arias S. Lifetime dietary change and its relation to increase in weight in Spanish women. *Int J Obes* 2000;24:14-19.
- Montero P, González B, Barroso A, Bernis C, Varea C, Arias S. Hábitos alimentarios de mujeres rurales y urbanas de la Comunidad de Madrid. In: Bernis C, López R, Prado C, Sebastián J, eds. *La salud de la mujer en el umbral del siglo XXI: Salud y Género*. Madrid, Spain: Universidad Autónoma de Madrid, 2001:169-176.
- Prado C, Carmenate M. Sintomatología climatérica en relación al morfotipo. Análisis comparativo en dos muestras (La Habana y Madrid). In: Varela T, ed. *Investigaciones en Biodiversidad Humana*. Santiago de Compostela, Spain: Universidad de Santiago de Compostela, 2000:648-658.
- Rebato E. Ages at menarche and menopause in Basque women. *Coll Anthropol* 1988;1:147-149.
- Sosa M, Navarro MC, Limina JM, et al. Age at menopause onset in Canary Islands women. *Rev Sanidad Higiene Publ* 1994;68:385-391.
- Varea C, Bernis C, Montero P, Arias S, Barroso A, González B. Secular trend and intrapopulation variation in age at menopause in Spanish women. *J Biosoc Sci* 2000;32:383-393.
- Benet Rodríguez M, Caravajal García-Pando A, García del Pozo J, Alvarez Requejo A, Vega Alonso T. Hormonal replacement therapy in Spain. *Med Clin (Barc)* 2002;119:4-8.
- Bermejo MJ, Perez IR. Physicians and the prescription of hormone replacement therapy in Spain. *Health Policy* 2005;73:58-65.
- Marín Torrens RM, Sanchez Canovas J, Donat Colomer F, Dupuy Layo MJ, Salas Trejo MD. The most common vital events in women 45-64 years of age. Repercussions as psychophysical stressors. *Aten Primaria* 1996;17:512-516.
- Martínez Anta FJ, Varela Prado E, Suárez Peña S. Menopausia y terapia hormonal sustitutiva: prevalencia en el municipio de Lugo. *Aten Primaria* 1994;14:1052-1056.
- Palacios S, Calaf J, Cano A, Parilla JJ. Relevant results of the WHI study for the management of menopause in Spain. *Maturitas* 2003;44:83-86.
- Pereiro Berenguer I, Sanfelix Genoves J, Garcia Cervera J, Furio Bonet S, Vicente Polo JM, Martínez Mir I. Compliance of hormone replacement therapy in menopausal women. *Med Clin* 2001;117:207-210.
- Schneider HP. Cross-national study of women's use of hormone replacement therapy (HRT) in Europe. *Int J Fertil Womens Med* 1997;42(Suppl 2):365-375.
- Castaño D, Martínez-Benlloch I. Aspectos psicosociales en el envejecimiento de las mujeres. *Anales Psicol* 1990;6:159-168.
- Conde F, Gabriel C. *Sistema de información sobre salud de carácter sociocultural: Las concepciones de salud de las mujeres: informe 2000*. Madrid, Spain: Comunidad de Madrid, Consejería de Sanidad, Instituto de Salud Pública, 2003.
- Palacios S, Ferrer-Barriandos J, Parrilla JJ, et al. Calidad de vida relacionada con la salud en la mujer española durante la perimenopausia y posmenopausia. Desarrollo y validación de la Escala Cervantes. *Med Clin (Barc)* 2004;122:205-211.
- Peiro Peréz R, Colomer Revuelta C, Puig Barbera J. Women's opinion about their health: a qualitative study. *Aten Primaria* 1999;24:12-18.
- Rodríguez Martín A, Fernández del Barrio MM, Fernández del Barrio T, Arango Fernández P, Martín Tello J. Use of health services by the climacteric women in primary health care: the need for an integral approach. *Eur J Epidemiol* 1999;15:231-236.
- Ruiz Pérez I, Montero Pinar I, Hernandez-Aguado I. Associated factors to psychiatric morbidity in postmenopausal phases. *Maturitas* 1997;28:107-115.
- de Santiago A, Vazquez JL, Diez JF. The feminine role as a determinant of mental health among the women of the general population of Cantabria [in Spanish]. *Actas LusoEsp Neurol Psiquiatr Cienc Afines* 1993;21:168-180.
- Cámara González C. *La menopausia: varios mitos y algunas realidades*. Editorial en *Centro de Salud*, 1997;5:419-420.
- Conde F, Gabriel C. Evolution of social representations about health among women from Madrid, 1993-2000 [in Spanish]. *Rev Esp Salud Publica* 2002;76:493-507.
- Delgado A, Sánchez MC, Galindo I, Pérez C, Duque MJ. Actitudes de las mujeres ante la menopausia y variables predictoras. *Aten Primaria* 2001;27:3-11.
- de la Gandara Martin J, Sanchez Hernandez J, Diez-Sanchez MA, Monje Hernandez E. Influencia de las actitudes, expectativas y creencias en la adaptacion a la menopausia. *Anuales Psiquiatria* 2003;19:329-336.
- Margarit Castells M, Prat Vigué G, Raich Soriguera A. Mujeres en la Menopausia: una experiencia de trabajo grupal. *Rev Servicios Sociales Política Social* 1999;46:55-64.
- Santiso Sanz R. La menopausia y la edad media de las mujeres: un análisis antropológico. *Acciones Invest Sociales* 2001;12:115-127.
- Obermeyer CM, Reher D, Cortes-Alcala L, Price K. The menopause in Spain: results of the DAMES (Decisions at Menopause) study. *Maturitas* 2005;52:190-198.
- Obermeyer CM, Ghorayeb F, Reynolds R. Symptom reporting around the menopause in Beirut, Lebanon. *Maturitas* 1999;33:249-258.
- Obermeyer CM, Schulein M, Hajji N, Azelmat M. Menopause in Morocco: symptomatology and medical management. *Maturitas* 2002;41:87-95.
- Obermeyer CM, Reynolds RF, Price K, Abraham A. Therapeutic decisions for menopause: results of the DAMES study in Central Massachusetts. *Menopause* 2004;11:456-465.
- Reynolds RF, Obermeyer CM. Age at natural menopause in Spain and the United States: results from the DAMES project. *Am J Hum Biol* 2005;17:331-340.
- Bernis C, Varea C, Arias S, Montero P, Barroso A, Gonzalez B. Parámetros óseos, capacidades funcionales y prevalencia de problemas osteomusculares en mujeres españolas de 45-65 años. *Antropol Portuguesa* 1998;15:123-139.
- Flint M, Samil R. Cultural and subcultural meanings of the menopause. *Ann N Y Acad Sci* 1990;592:134-148.
- Lock M, Kaufert P, Gilbert P. Cultural construction of the menopausal syndrome: the Japanese case. *Maturitas* 1988;10:317-332.

46. Shea JL. Women's midlife symptom-reporting in China: crosscultural analysis. *Am J Hum Biol* 2006;18:219-222.
47. Obermeyer CM. Menopause across cultures: a review of the evidence. *Menopause* 2000;7:184-192.
48. Instituto Nacional de Estadística. *Censo de Población y Vivienda de 2001*. INE: Madrid www.ine.es.
49. Instituto de Estadística de la Comunidad de Madrid. *Explotación estadística del Impuesto sobre la Renta de las Personas Físicas (IRPF) de la Comunidad de Madrid. 1999*, Madrid: Comunidad de Madrid, 2003.
50. Deleted in proof.
51. Nagel G, Altenburg HP, Nieters A, Boffeta P, Linseisen J. Reproductive and dietary determinants of the age at menopause. *Maturitas* 2005;52:337-347.
52. Wilbur J, Miller MA, Montgomery A, Chandler P. Sociodemographic characteristics, biological factors and symptom reporting in midlife women. *Menopause* 1998;5:43-51.
53. Carda SN, Bilge SA, Öztürk TN, Oya G, Ece O, Hamiyet B. The menopause age related factors and climacteric symptoms in Turkish women. *Maturitas* 1998;30:37-40.
54. de Vries E, den Tonkelaar I, van Noord P, van der Schouw YT, te Velde ER, Peeters PH. Oral contraceptive use in relation to age at menopause in the DOM cohort. *Hum Reprod* 2001;16:1657-1662.
55. Miller SR, Gallichio LM, Lewis LM, et al. Association between race and hot flashes in midlife women. *Maturitas* 2006;54:260-269.
56. Brambilla DJ, McKinlay SM. A prospective study of factors affecting menopause. *J Clin Epidemiol* 1989;42:1031-1039.
57. Midget AS, Baron JA. Cigarette smoking and the risk of natural menopause. *Epidemiology* 1990;1:474-478.
58. Im IU, Meleis AI, Park YS. A feminist critique of research on menopause experience in Korean women. *Res Nurs Health* 1999; 22:410-420.
59. Khademi SK, Cooke MS. Comparing attitudes of urban and rural Iranian women toward menopause. *Maturitas* 2003;46:113-121.
60. Gannon L, Stevens J. Portrait of menopause in the mass media. *Women Health* 1998;27:1-15.
61. Reher DS. Family ties in Western Europe: persistent contrasts. *Popul Dev Rev* 1998;24:203-234.
62. Dvornyk V, Long JR, Liu PY, et al. Predictive factors for age at menopause in Caucasian females. *Maturitas* 2006;54:1-26.