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CROSS CULTURAL ANALYSIS OF DETERMINANTS OF HOT FLASHES AND NIGHT SWEATS: LATIN-AMERICAN IMMIGRANTS TO MADRID AND THEIR SPANISH NEIGHBORS

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Abstract

Objective—This study applies a biocultural perspective to better understand the determinants of hot flashes and night sweats within immigrant and local populations in Madrid, Spain.

Methods—A combined sample of 575 women from Madrid, aged 45 to 55, was drawn from two studies. The Spanish sample (n=274) participated in the Decisions at Menopause Study (DAMES) in 2000–2002. The Latin-American sample (n=301) was drawn from immigrants to Madrid in 2010–2011. Chi square analyses and logistic regression models were carried out among the combined controlling by origin of provenance.

Results—Forty four percent of the women reported hot flashes, 36% reported night sweats and 26% both symptoms. Compared to Spanish women, Latin-American women were less likely to report hot flashes (OR 0.7, 95% CI 0.4–0.9) after controlling for demographic variables and menopausal status. The same was not found for night sweats and for both symptoms combined. Determinants of hot flashes differed from determinants of night sweats.

Conclusions—Because determinants differed, hot flashes and night sweats should be queried and analyzed separately. Latin-American women were less likely to report hot flashes, but not night sweats or both symptoms combined. More research is needed to clarify the differences in reported hot flashes as the lesser report among immigrants could have been a cultural rather than a biological phenomenon.

Keywords

Menopause; hot flashes; vasomotor symptoms; Latin-American immigrants

Introduction

Latin-American migration to Spain is a recent process. The migratory wave has increased since 2000, but now immigrants are arriving during a period of economic recession. The principal countries of migration are Ecuador, Peru, Colombia, the Dominican Republic and, more recently, Bolivia[1]. The main reason for migration is economic. Contrary to other

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migratory groups, such as Moroccans and Europeans, women have started migrating to Spain from Latin-America [2], the labor market opened for women because of the care needed by the aging Spanish population[3]. Independent of their level of education, women are working as domestic-helpers or personal care aides. These jobs have low salaries and, in the case of domestic-helpers, do not have unemployment benefits [4].

Oftentimes these women are the head of their families. They are the main economic contributors to the family incomes in both Spain and in their countries of origin. This has been accentuated lately as their partners have lost their jobs due to the slowdown of the construction sector. Although women were looking to improve the quality of life for their family, immigration families are often divided and women have to worry about problems in both Spain and back home [5]. For many of these women the Spanish economy was better when they decided to migrate than it is at the moment of the interview.

Spain, as the host society, has developed some programs to try to deal with discrimination issues and has created some social support safety-nets, but these are insufficient [6]. In addition, some of these women are illegal immigrants or have lost their visas due to unemployment. Not everything is negative, however. Migrating to Spain is a challenge and in some cases it can be an improvement in terms of health care because Spanish health care is universal and free. Economic status can also be improved compared to their countries of origin. For example, in Ecuador, in 1997–1998, the GDP went down from $19.710 to $13.769 million. From 1995 to 2005, poverty rose from 34% to 71% and extreme poverty from 12% to 31%. These changes triggered the economic migration to Spain[7].

For Latin American immigrants to Spain, the social and economic environment is complex and can be stressful. In the midst of this context, women experience the changes of menopause. Among menopausal symptoms, the vasomotor symptoms of hot flashes and night sweats are the symptoms most often analyzed in the literature, as they impact quality of life and often lead women to seek treatment [8].

This paper applies a biocultural perspective to better understand the determinants of hot flashes and night sweats within immigrant and local populations in Madrid, Spain. It is important to evaluate the factors affecting the menopausal experience among immigrants because of the adjustments migrant women have to make due to social, cultural and environmental changes. By studying menopause across countries or ethnicities it is possible to document human variation and potentially elucidate how biology and culture interact in female aging.

Various determinants of hot flashes have been identified, including menopausal status[9–11], education [12, 13], smoking [14], alcohol consumption [12], BMI [14, 15], exercise[16–18], parity [13], hormonal therapy use [12], ambient temperature[19], perceived stress[15], and ethnicity [9, 20]. A number of cross-cultural and longitudinal studies have shown an effect of ethnicity on hot flashes frequency. For example self-rated health status and acculturation was associated with vasomotor symptoms in a sample of Asian women who had immigrated to the United Kingdom[21]. In the Decisions At Menopause Study (DAMES), differences in symptoms frequencies between Spanish, Moroccan, Lebanese and U.S populations remained after controlling for demographic variables and menopausal status[9]. The Study of Women's Health Across the Nation (SWAN) likewise found that ethnicity was associated with symptoms. Vasomotor symptoms were more likely to be reported among Africa-American compared to White women, although this relationship was not shown for Hispanic compared to White women [20].

Few studies have considered the immigration process and its influence in the menopausal transition. Most studies that take into account ethnicity have analyzed women of the second

or more generation [10, 22]. Studies among migrant populations have described Chinese and Arabic immigrant women living in Australia[23, 24] and Soviet Union women living in USA[25]. Comparative studies among migrant and sedentee populations have been carried out among Chinese[26], Indian [27] and Israeli populations [28]. With regard to Latin American populations, Nedstrand, et al. [29] compared Chilean women who migrated to Sweden and Swedish women. In these studies either country of residence or ethnicity influenced women's symptomatology. Studies conducted so far, focus on populations with a long migratory history; most of the participants have been living in the host societies for over 20 years. However, Latin- Americans women who migrate to Spain constitute a recent migratory pattern (average residential time is 7 years [30]). Living strategies, social networks and facilities for migrants have not been fully developed in this short period, thus the stress of migration is presumably higher for Latin-American immigrants. This situation provides a good opportunity to further understand how change in context due to migration affects the menopausal experience. This study will also increase the knowledge about vasomotor symptoms and their determinants among Latin American women, an under-studied population in their host societies and in their countries of origin.

Aims of this article are: (1) to test whether the determinants of hot flashes and night sweats are the same when evaluated separately as when they are grouped together. This is because in some studies hot flashes and night sweats are not queried separately and they are often analyzed together. And (2) to evaluate differences in hot flash and night sweat frequencies, after controlling for confounding factors for vasomotor symptoms between Latin-American immigrants and Spanish women. Stress has been associated with an increase in hot flashes [15, 31–33] and also with migration [34]. Migration is a stressful process because of difficulties related to adaptation to the host society and loss of previous social support [34–36]. Thus, it is hypothesized here that Latin-American women will report higher hot flashes frequencies.

Methods and samples

The data analyzed here come from two surveys. The Spanish survey is a randomly selected sample of 300 women aged 45 to 55 residing in Madrid, Spain. The survey was conducted in Madrid, in 2002–2003 as part of DAMES [37]. The instrument included closed and open-ended questions about demographic and socio-economic information, health and reproductive history, symptoms in the past month, use of health services, life style, and therapeutic decisions. More information about this survey can be found in Obermeyer et al. [37]. In DAMES survey 18 women were born in foreign countries (Morocco, Philippines, United States, France, Portugal, United Kingdom, Ecuador, Colombia, Puerto Rico, Peru, Dominic Republic and Argentina). Another eight women were 56 and 57 years old at the moment of the interview. For the comparison conducted here a subset of women 45–55 years born in Spain was chosen, totaling 274 informants.

The second survey was conducted among 301 Latin-American women immigrants to Madrid, aged 45 to 55 years, in 2010–2011. This is not a random sample, because it is no longer possible to obtain names and addresses from the Instituto Nacional de Estatistica for random selection due to the tightening of data protection laws. Even if the data were available, there would be a high error rate in the population registry in relation to the residential addresses of immigrants as shown in the Encuesta Nacional de Inmigrantes [2, 38]. Instead of a random sample, quotas based on country of origin were introduced to provide a representative sample. Quotas were based on segmentation information obtained from the Continuous Register of Population conducted in January 2010 [1]. The Continuous Register of Population is an accurate source for the number of Latin-American immigrant women living in Madrid[39].

The immigrant population is not an easily accessible population. Menopause is still a subject rarely discussed among women, and it is important to establish a first contact so that women will have confidence in the study. First contact was made through call centers, neighborhood shops, events related to immigration, churches, immigrant associations, universities, women's events or meetings, Spanish contacts who were familiar with Latina populations in Madrid, cultural mediators, and through the women interviewed.

The Latin-American survey employed a questionnaire comparable to the one used in DAMES and, in addition, collected information about migration, changes in economic status, transnational families, time of migration, motivation for migration, future plans, legal status, changes in diet, and people with whom women spoke about menopause. Women were also asked to describe differences in their beliefs about menopause in comparison with other women in Spain.

Both studies were conducted by face- to- face interviews. Employing similar methodology for collecting the data, e.g., same age range and survey instrument, except for the immigration information, ensured the comparability of the two samples. The same list of symptoms experienced in the past month was employed in the two studies. A key feature of the check list was that menopausal symptoms, e.g., hot flashes and night sweats, were embedded in an inventory that included other symptoms in order to reduce the likelihood that responses would conform to prevalent stereotype about menopause. To query symptom frequency women were asked if they had experienced any of the symptoms during the last month. Then they were presented with a list of vasomotor, cardiovascular, genitourinary, mental/emotional, and general symptoms. Each symptom was recorded as yes/no. This list has been validated for cross-cultural comparisons[9]. In the Latin American sample interviews were tape recorded as a method to collect qualitative data.

Menopause status was classified using the Stages of Reproductive Aging Workshop (STRAW+10) classification [40]. Based on reported date of last menstruation, pre-menopausal women were defined as those who had regular menstrual cycles, peri-menopausal women were defined as those who had a period in the last 60 days but had irregularity in their bleeding patterns (early peri-menopausal) and those who had skipped two or more cycles but had a period in the last year (late peri-menopausal). Post-menopausal women were defined as those women who had no menstrual bleeding in the previous 12 months. If their last period was less than 5 years ago they were considered to be early post-menopausal and if it was 5 or more years ago they were defined as late postmenopausal. For the analyses presented here, early and late peri-menopausal women have been combined into one category, and early and late post-menopausal women have also been combined. Women who have undergone a hysterectomy and/or bilateral oophorectomy and/or had lost their periods due to chemotherapy were classified as induced menopausal. This last category could include women who are hormonally pre-menopausal as their ovaries have not been removed. For this reason, the category of induced menopause is separate from the category of natural menopause.

Chi square analyses were used to examine differences in demographic characteristics between the Spanish and the Latin- America samples. Chi square analyses were also used to examine hot flashes, night sweats and having experienced both hot flashes and night sweats in relation to menopausal status, education levels (Primary or less, Secondary or professional training, University or postgraduate), smoking (yes, no), alcohol consumption (Never or 1/month, 1/month to 1/day, Every day or more), use of hormonal therapy at time of interview (yes, no), exercise (None or light, Moderate or heavy), BMI (Normal, overweight, obese), parity (yes, no), self-rated health (Fair or poor, Good or better), cardiovascular symptoms (yes, no) and place of birth (Spain, Latin-America). The

measurement of exercise was based on the DAMES analysis[12]. Women were asked how often they engaged in light exercise (never, less than once a week, about once a week, twice a week, three times or more a week) and how often they engaged in moderate to heavy exercise – enough to speed up breathing and/or heart rate. An exercise index based on self reported frequency of exercise was constructed and women were grouped into four exercise categories: most intense (heavy exercise 2 times/week with any light exercise), moderate (light exercise 3 times/week with heavy exercise 0 to 1/week), light (other combinations of light and heavy 1 to 2/week), and negligible (no exercise, or light exercise less than once a week). The exercise index was regrouped into two categories: None or light (negligible and light) and moderate or heavy (moderate and most intense). Income was not analyzed because it was associated with education levels ($p<0.01$). Education levels were chosen as the variable to introduce into the analyses as a measure of socioeconomic status. A dichotomous variable of cardiovascular symptoms was constructed. Women who self-reported having experienced either palpitations, shortness of breath or chess pressure in the last month were grouped together in opposition to women who had not experienced any of these symptoms. Each of these symptoms was queried separately as yes/no. The grouped category was based on the same category conducted in DAMES [37] and has been previously employed to compared these symptoms in the other countries included in the study (Morocco, Spain, US and Lebanon)[9].

The variables listed above were analyzed in relation to hot flash experience, night sweats and both hot flashes and night sweats using multiple logistic regression analyses for the combined samples controlling by place of birth. Multiple logistic regression analyses permit the control of confounding factors and determine whether there are differences in the report of vasomotor symptoms between the two population samples. All factors were entered simultaneously in the models. Statistical analyses were carried out using SPSS (version 15.0).

Results

Demographic characteristics differ between the Spanish and Latin-American samples (Table I). Despite Latin-American women having higher education levels their mean income was lower than the Spanish women. Both populations had healthy life styles with low alcohol consumption, high activity levels, and most were non-smokers. Latin-American women had the healthiest life styles, thirty two percent of the Spanish women smoke compared with thirteen percent of Latin-Americans, but this was not reflected in the body mass index (BMI). Despite the same level of exercise, more than 60% of the Latin-American women were overweight or obese. Thirty-seven percent rated their health as fair or poor compared to 16% of the Spanish. There were also differences in childbearing patterns, less than one in ten Latin-American women did not have children compared to 22% of the Spanish sample. Although more Spanish women were in the older age group, chi square analysis showed no significant differences between age groups by country of origin. Considering that there was no difference in age between the two samples, Latin American women were ahead of their Spanish counterparts in their menopause transition because age at menopause was earlier among Latin-American women. Even though less of the Spanish sample is peri-or post-menopausal, they have a more medicated transition; 9.5% of the women were taking hormone therapy (HT) at the moment of interview compared to 2% of the Latin-American sample.

Vasomotor symptoms were associated with some of these demographic characteristics (Table II). Forty four percent of the women reported hot flashes (46.4% within the Spanish sample and 41.2% of the Latin-American sample) and 35.8% reported night sweats (34.7% within the Spanish sample and 36.9% of the Latin-American sample). Twenty six percent of

the women reported both symptoms, night sweats and hot flashes (26.3% within the Spanish sample and 25.2% of the Latin-American sample). Hot flashes and night sweats were not always experienced together; there are women who only have hot flashes and others who only report night sweats. In Chi squared analyses hot flashes and night sweats were associated with menopausal status. Peri-menopausal women had the highest report of hot flashes. Women with no children had more hot flashes, although this was not shown for night sweats or for the most symptomatic women that reported both hot flashes and night sweats. Women with cardiovascular symptoms or fair/poor self rated health were more likely to report hot flashes, night sweats or both. Education, smoking, alcohol consumption, exercise, BMI, HT and place of birth were not associated with vasomotor symptom report in Chi squared analyses.

The results of multiple logistic regression analyses indicate that, after controlling for demographic variables and menopausal status, Latin-American women were less likely to report hot flashes compared to Spanish women (OR 0.7, 95% CI 0.4–0.9) (Table III). This same relationship was not significant for night sweats (OR 1.0, 95% CI 0.7–1.5) or for women who had both hot flashes and night sweats (OR 0.8, 95% CI 0.5–1.3). Peri-menopausal women were more likely to report hot flashes compared to pre-menopausal women (OR 3.4, 95% CI 2.1–5.7), as were post-menopausal women (OR 2.3, 95% CI 1.4–3.5) and women with induced menopause (OR 2.1, 95% CI 1.1–3.8).

Peri-menopausal women were more likely to report night sweats and both vasomotor compared to premenopausal women (OR 1.7, 95% CI 1.0–2.9; 2.5, 95% CI 1.4–4.4 respectively), as were post-menopausal women (OR 1.7, 95% CI 1.1–2.7; 2.1, 95% CI 1.2–3.5 respectively).

Women who complained of cardiovascular problems (e.g., palpitations, shortness of breath and chest pressure) were more likely to report hot flashes, night sweats and both (OR 1.6, 95% CI 1.1–2.2; 1.8, 95% CI 1.3–2.7; 1.6, 95% CI 1.0–2.4 respectively).

Women who rated their health as good or better were less likely to report night sweats (OR 0.6, 95% CI 0.4–1.0) and both hot flashes and night sweats (OR 0.6, 95% CI 0.4–1.0) compared to women who rated their health as fair or poor. This relationship was not observed for hot flashes alone.

Education, smoking, alcohol consumption, HT, parity, BMI and exercise were not significant in any of the regression models.

Discussion

Hot flashes during the last month were reported among 43.7% of all participants and 35.8% reported night sweats. Latin- American women report lower or similar frequencies of vasomotor symptoms than the Spanish women, which was contrary to our expectation that the stress of migration would result in higher symptom frequencies. Different determinants influence the frequency of vasomotor symptoms. Frequencies of symptoms are primarily influenced by menopausal status and self-reported experience of cardiovascular symptoms. Self-reported health status was associated with night sweats and with the report of both hot flashes and night sweats. Ethnicity remained associated with reporting frequency of hot flashes after controlling for confounding factors.

Hot flashes are generally reported more frequently than night sweats in studies that have queried both symptoms separately [10, 41–43]. An exception was a study carried out among Indonesian women, who were the only participants in a study of 7 Asians countries to report more night sweats than hot flashes [44]. In the study presented here, only 25.7% of the women

experienced both hot flashes and night sweats. Consistent with the findings of this study, a study carried out in Massachusetts found that not all women who experienced hot flashes had experienced night sweat and vice versa [12].

Although parity and self-rated health were significantly associated with hot flashes in Chi squared analyses, when entered into a regression model they were no longer significantly associated with report of hot flashes. Ethnicity was not associated with hot flashes in chi square analysis, but after controlling for confounding variables (e.g., menopausal status, education, smoking, alcohol consumption, HT use, BMI, parity and self-rated health) ethnicity became a significant factor associated with hot flashes.

Differences in hot flashes result from the complex interaction of biological and cultural influences on women's menopausal experience [41]. Latin-American women reported significantly fewer hot flashes compared to Spanish women, contrary to what we had hypothesized. Consistent with the findings of this study, a study carried out in Israel comparing Jewish immigrants from Soviet Union and Arabs women with Jewish residents found that immigrants and Arab (compared to Jewish residents) had a lower likelihood of reporting hot flashes in logistic regressions [28]. In this article Lerner-Geva et al speculate about the effects of acculturation bias, less exposure to western notions about menopause, less medicalization of the menopausal process, less willingness to discuss hot flashes, or a tendency toward natural acceptance of these symptoms as part of menopause and aging to explain the lower frequency of hot flashes among immigrants. In a study conducted in Hilo, Hawaii, Japanese-American women were less likely to report a hot flash on questionnaire, but equally likely to both subjective report and objectively demonstrate a hot flash during ambulatory an laboratory monitoring compared to women of European or Mixed descent [45]. It would be interesting to measure objective hot flashes between the populations in Spain, as the lesser report of hot flashes among immigrants could have been a cultural rather than a biological phenomenon.

Vasomotor symptoms are mainly associated with menopausal status, thus hormonal change. The finding that the likelihood of hot flashes increased with peri-menopausal status compared to pre-menopausal status (OR 3.4,95% CI 2.1–5.7, $p< 0.01$) is consistent with other studies [9, 12, 43]. In studies of vasomotor symptoms, it is more important to control for menopausal status than chronological age, particularly as Latin-American women have an earlier age at menopause compared to Spanish women [46]. For example, age at menopause was 48.6 years among the 17,150 women studied in 15 Latin-American countries [47] compared to 51.7 years for Spanish women[48].

Self reported health status was associated with the experience of night sweats and with percentage of women who have both hot flashes and night sweats, but it was not a significant factor for hot flashes. Poor health was also associated with vasomotor symptoms in Asian women who had migrated to England [21]. Self rated health is a subjective but also an objective measure of quality of life as it reflects the physical state, diseases previously suffered, and socio-economical conditions and it has been considered to be a predictor of mortality [49, 50]. Despite its simplicity, it is a measure of morbidity and it is helpful for population comparability [50]. However, a causal relationship cannot be assumed, as it is likely that having night sweats or both symptoms might influence the belief of having a poor health. It seems reasonable with these results to hypothesize that hot flashes alone are not as inconvenient as night sweats. Night sweats might be disturbing sleeping patterns and affecting resting periods for self recovery.

Cardiovascular symptoms (e.g palpitations, shortness of breath and chest pressure) were significant associated with hot flashes, night sweats and both. The Collaborative Group for

Research of the Climacteric in Latin America Study (REDLINC) found that Latin-American women with vasomotor symptoms (hot flashes and/or night sweats) had a higher likelihood of having heart discomfort compared to women without vasomotor symptoms (OR 5.24, 95% CI 4.75–5.78) in chi square analyses[13]. Although there are methodological differences because they did not query hot flashes and night sweats separately, their findings are consistent with our study. When women have a hot flash, their pulse rate increases and their blood pressure is elevated in the ten minutes immediately after an objectively measured hot flash [51, 52]. Tachycardia has been employed as a physiological criteria to detect hot flashes[53]. Tachycardia could be experienced and expressed as the feeling of palpitations.

Although smoking is thought to have an antiestrogenic effect, so that women who smoke are more likely to report hot flashes [14, 31, 54], this relationship was not found in our study. In multivariate models, Gold et al. found that passive but not active smoking was associated with vasomotor symptoms [15]. Other studies have likewise not found smoking to be associated with report of hot flashes[12, 42, 55, 56].

Education, alcohol consumption, parity, exercise, BMI and HT were not associated with vasomotor symptoms in the logistic regression models presented here. This finding is of interest because Latin American women had higher levels of education and parity and 60% were obese. When comparing education levels, we have to consider that data for the Spanish population were collected ten years ago and probably Spanish women have higher levels of education at the moment. With regard to BMI it would be of interest to investigate whether the frequency of obesity is due to genetic factors or diet as levels of exercise did not differ between the population samples, and alcohol consumption was lower in Latin-American than the in Spanish population. Other studies have also found a lack of association between hot flashes and education[15], BMI[28, 56], parity[56], exercise [15, 57] and alcohol consumption [15, 56]. In a study conducted among Latin-American women, HT was not associated with hot flashes in perimenopausal women, but the investigators did not conducted logistic regressions [13]. Current use of HT is relative low in Spanish women (9.5%) and even lower in Latin-American women (2%). This low level of use could be related to an adjustment in physicians' practices due to new scientific evidences after the publications of Women's Health Initiative Study[37], or due to different cultural ways of managing menopause.

One limitation of this study is that Spanish data were collected eight years before Latin-American data. The time lag between the two studies may have contributed to an increase in the differences in HT use. It could have also contributed to a lesser difference in socioeconomic status between the populations as salaries in the Spanish population have probably increased and the economic crisis has had a greater impact on the immigrant population. During the crisis years, widespread loss of jobs was much higher for non-EU immigrants (−44%), than for Spanish natives (−27%)[58]. During this time it is unlikely that there has been any change in awareness or education about menopausal symptoms that affected the reporting of symptoms in the Spanish group of women.

In general, a fair amount of the variation in hot flashes frequencies across populations could potentially be explained by differences in methodology[55]. One of the strengths of this study is that the same methodology has been employed to collect data among the Latin-American sample as among the Spanish sample. This ensures the comparability of both data. Other studies conducted among Spanish population have found differences in hot flashes related to environmental context such as rural, semi-urban and urban place of residence [56]. In our study all women were residing in the urban context of Madrid. Previous studies were conducted in 1996–1998 in semi urban and rural populations of Madrid[59]. The DAMES study is the latest study carried out in the urban Spanish population [56]. We have to be aware

of differences due to the time lag between studies; however the comparison across populations can shed light on the ethnic differences associated with the growing multicultural reality of Madrid.

Conclusion

The determinants of hot flashes, night sweats, and both hot flashes and night sweats differed. Ethnicity was associated with hot flash experience but this association was not observed for night sweats or for the most symptomatic women. Hot flashes were experienced less frequently by Latin-American migrants compared to Spanish women. Self reported health-status was associated with the experience of night sweats and both night sweats and hot flashes. This same relationship was not observed for hot flashes alone. Menopausal status and self reported experience of cardiovascular symptoms were constantly associated with vasomotor report. We suggest that it is important to conduct separate analysis for vasomotor symptoms in cross-cultural surveys. More research, including objective versus self reported hot flash frequencies, is needed to clarify the differences in reported hot flashes frequencies as the lower report among immigrants could be a cultural rather than a biological phenomenon.

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Table I

Demographic characteristics of the sample %

	Combined Samples n=575	Spanish sample, n=274	Latin-American sample, n=301
Place of birth			
Spain	47.7	100	0
Latin-American	52.3	0	100
Age			
45–49	47.1	44.5	49.5
50–55	52.9	55.5	50.5
Education			
Primary or less	23.1	28.5	18.3*
Secondary or professional training	47.7	44.2	50.8
University or post graduate	29.2	27.4	30.9
Income			
<18000 Euros	50.8	38.9	59.8*
18000–30000 Euros	34.5	33.6	35.2
>30000 Euros	14.7	27.5	5.0
Menopausal status			
Pre-menopausal	30.3	35.4	25.6*
Peri-menopausal	21.7	19.0	24.3
Post-menopausal	37.2	35.4	38.9
Induced menopausal	10.8	10.2	11.3
Smoking at interview			
No	77.2	66.8	86.7*
Yes	22.8	33.2	13.3
Alcohol consumption			
Never or <1/month	52.7	38.3	65.8*
1/month to <1/day	38.3	47.4	29.9
Every day or more	9.0	14.2	4.3
Use of hormone therapy at interview			
No	94.4	90.5	98.0*
Yes	5.6	9.5	2.0
Exercise			
None or light	36.0	35.0	36.9
Moderate or heavy	64.0	65.0	63.1
BMI			
Normal	47.0	56.9	37.9*
Overweight	38.6	34.7	42.2
Obese	14.4	8.4	19.9
Parity			
No	13.9	21.9	6.6*

	Combined Samples n=575	Spanish sample, n=274	Latin-American sample, n=301
Yes	86.1	78.1	93.4
Self rated health			
Fair or poor	26.8	15.8	36.9*
Good or better	73.2	84.2	63.1

*p<0.001 Differences in demographic characteristic comparing Spanish and Latin-American samples

Table II

Percentage of women reporting vasomotor symptoms

	Hot flashes	Night sweats	Both hot flashes and night sweats
Total	43.7	35.8	25.7
Menopausal status			
Pre-menopausal	29.3**	27.0*	16.1**
Peri-menopausal	56.0	40.0	32.0
Post-menopausal	47.2	39.7	29.9
Induced menopausal	46.8	38.7	25.8
Education			
Primary or less	48.9	36.1	29.3
Secondary or professional training	44.5	35.4	25.9
University or post graduate	38.1	36.3	22.6
Smoking at interview			
No	43.7	34.9	25.0
Yes	43.5	38.9	28.2
Alcohol consumption			
Never or <1/month	42.9	37.0	27.7
1/month to <1/day	45.9	34.1	23.6
Every day or more	38.5	36.5	23.1
Use of hormone therapy at interview			
No	43.8	35.4	25.2
Yes	40.6	43.8	34.4
Exercise			
None or light	43.0	33.8	23.7
Moderate or heavy	44.0	37.0	26.9
BMI			
Normal	42.2	33.7	24.4
Overweight	45.5	37.8	26.1
Obese	43.4	37.3	28.9
Parity			
No	53.8*	43.8	32.5
Yes	42.0	34.5	24.6
Self rated health			
Fair or poor	51.3*	46.1**	35.1**
Good or better	40.7	31.9	22.1
Cardiovascular symptoms			
No	38.3**	28.5**	20.8**
Yes	49.5	43.7	31.0
Place of birth			
Spain	46.4	34.7	26.3
Latin-America	41.2	36.9	25.2

*
p<0.05;

**
p<0.01

N=575 Cardiovascular symptoms category refers to having experienced in the last month any of the following: palpitations, chest pressure, or shortness of breath.

Table III

Results of multiple logistic regression analysis to predict vasomotor report.

	Hot Flashes		Night Sweats		Both hot flashes and night sweats	
	OR	**CI**	**OR**	**CI**	**OR**	**CI**
Place of Birth						
Spain	-	-	-	-	-	-
Latinamerica	0.7*	(0.4–0.9)	1.0	(0.7–1.5)	0.8	(0.5–1.3)
Menopause Status						
Pre-	-	-	-	-	-	-
Peri-	3.4**	(2.1–5.7)	1.7*	(1.0–2.9)	2.5**	(1.4–4.4)
Post-	2.3**	(1.4–3.5)	1.7*	(1.1–2.7)	2.1**	(1.2–3.5)
Induced	2.1*	(1.1–3.8)	1.5	(0.8–2.9)	1.7	(0.8–3.5)
Education						
Less	-	-	-	-	-	-
Graduate school	0.7	(0.5–1.0)	1.1	(0.7–1.7)	0.8	(0.5–1.3)
Smoking (current)						
No	-	-	-	-	-	-
Yes	0.9	(0.6–1.4)	1.2	(0.8–1.8)	1.1	(0.7–1.8)
Alcohol consumption						
Never or<1/month	-	-	-	-	-	-
1/month to 1/ day	1.2	(0.8–1.8)	0.9	(0.6–1.4)	0.9	(0.6–1.4)
Every day	0.9	(0.5–1.7)	1.1	(0.6–2.2)	0.9	(0.4–1.8)
Self-rated health status						
Fair or Poor	-	-	-	-	-	-
Good or better	0.7	(0.4–1.0)	0.6*	(0.4–1.0)	0.6*	(0.4–0.9)
Hormone Therapy (current)						
No	-	-	-	-	-	-
Yes	0.6	(0.3–1.3)	1.2	(0.5–2.5)	1.2	(0.5–2.6)
Parity						
No	-	-	-	-	-	-

	Hot Flashes		Night Sweats		Both hot flashes and night sweats	
	OR	**CI**	**OR**	**CI**	**OR**	**CI**
Yes	0.6	(0.4–1.1)	0.6	(0.4–1.1)	0.6	(0.4–1.1)
BMI						
Normal	-	-	-	-	-	-
Overweight	1.1	(0.7–1.5)	1.2	(0.8–1.7)	1.0	(0.7–1.6)
Obese	1.1	(0.7–1.9)	1.2	(0.7–2.0)	1.2	(0.7–2.3)
Exercise						
Non or light	-	-	-	-	-	-
Moderate or heavy	1.0	(0.7–1.4)	1.2	(0.8–1.8)	1.2	(0.8–1.8)
Cardiovascular symptoms[b]						
No	-	-	-	-	-	-
Yes	1.6*	(1.1–2.2)	1.8**	(1.3–2.7)	1.6*	(1.0–2.4)

*p<0.05;

**p< 0.01

Cases included in the model N=574; N= 273 (Spain); N=301 (Latin-America) Factors were simultaneously adjusted for one another in multiple logistic regression models

[b]Cardiovascular symptoms category refers to having experienced in the last month any of the following: palpitations, chest pressure, or shortness of breath.