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Ethnic Differences in Symptoms Experienced During the Menopausal Transition

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Abstract

Our purpose in this study was to explore ethnic differences in symptoms experienced during the menopausal transition among four major ethnic groups in the U.S. using a feminist perspective. This was a cross-sectional correlational study among 158 midlife women. The instruments included are: questions on sociodemographic characteristics, health, and menopausal status, and the Midlife Women's Symptom Index. The data were analyzed using descriptive and inferential statistics. Significant ethnic differences in the total number of symptoms ($p < .01$) were found. The most frequently reported symptoms differed by ethnicity. The symptoms experienced during the menopausal transition were significantly associated with some contextual factors.

Keywords

Ethnicity; Menopause; Symptoms; Midlife; Women

Ethnic Differences in Symptoms Experienced During the Menopausal Transition The U.S. Census Bureau (USCB) projected that by the year 2020 members of ethnic minority groups will go from being one out of four Americans to one out of three (USCB, 2000). This changing racial and ethnic makeup of the U.S. population prescribes that health professionals need to practice with greater cultural competence in areas such as management of symptoms experienced during the menopausal transition, where cultural beliefs mediate the biology of reproduction and aging. However, most knowledge related to symptoms experienced during the menopausal transition comes from studies of White women (Alder et al., 2000; Andrist & MacPherson, 2001). This lack of knowledge about ethnic-specific symptoms experienced during the menopausal transition results in culturally inadequate or inappropriate health care for ethnic minority menopausal women in the U.S. (Bell, 1995; Berg & Lipson, 1999; Strickland & Dunbar, 2000).

Although some cross-cultural investigations have recently reported significant ethnic differences in symptoms experienced during the menopausal transition (Grisso et al., 1999; LaFerrere et al., 2002; Lovejoy et al., 2001; McCarthy, 1994; McCrohon et al., 2000; Parfitt et al., 1997; Probst-Hensch et al., 2000; Wilbur et al., 1998), existing studies have limited usefulness. The study populations have tended to be limited to a specific ethnic group in a single foreign country, and very few researchers have sampled nationwide in the U.S. As a result, what is known about ethnicity and menopause has limited applicability to health care settings in the U.S. Moreover, health care providers lack accurate knowledge about how ethnic

minority women actually experience symptoms during the menopausal transition (Bell, 1995; Sarwar, 1998; Strickland & Dunbar, 2000).

Our purpose in this study reported in this paper was to explore ethnic differences in symptoms experienced during the menopausal transition among four major ethnic groups of mid-life women in the U.S. This was part of a larger study comparing psychometric properties of different formats of the Midlife Women's Symptom Index (Author, 2005; Author, 2006). In the study presented in this paper, "symptoms" referred to subjective experiences reflecting changes in a person's bio-psycho-social function, sensation, and cognition (Blacklow, 1983). Also, in this study, the menopausal transition means the period that begins with variation in menstrual cycle length in a woman who has a monotropic FSH rise and ends with the final menstrual period.

Our specific aims were:

1. To describe symptoms experienced during the menopausal transition of four major ethnic groups of mid-life women in the U.S.
2. To explore ethnic differences in the symptoms.
3. To explore associations between the symptoms and contextual factors.

Throughout the research process, a feminist stance was taken, and it was assumed that inadequate management of symptoms experienced during the menopausal transition reported by ethnic minority groups of women comes from pure biology, and from women's continuous interactions with their environment (Andrist & MacPherson, 2001; Ford-Gilboe & Campbell, 1996). As feminist researchers emphasize (Hall & Stevens, 1991), research participants' own views, perspectives, opinions, and experiences were respected. For example, in the study presented in this paper, the Mid-life Women's Symptom Index with a wide range of symptoms was used rather than instruments specifically measuring symptoms experienced during the menopausal transition (which have been developed among Western women and list a limited number of symptoms that are prevalent among Western women). In addition, as all feminist theory posits, gender was regarded as a significant characteristic that interacts with other contextual factors (e.g., race, ethnicity, and class) to structure relationships among individuals (Ruzek et al., 1997). Consequently, in the study, ethnicity was viewed as one of the significant characteristics that circumscribe women's symptom experience during the menopausal transition, and thus we focused on ethnic variations in symptoms experienced during the menopausal transition.

In the study, *culture* is defined as the nonphysical traits such as values, beliefs, attitudes, and customs that are shared by a group of people and passed from one generation to the next (Spector, 2000). Race and ethnicity are often erroneously interchanged (Lipson & Dibble, 2005). In this study, *race* is narrowly defined as human biological variation (Lipson & Dibble, 2005), and *ethnicity* is defined as a cultural group's sense of identification associated with the group's common social and cultural heritage (Spector, 2000). *Ethnic identity* is defined as a subjective sense of social boundary and self-definition (Meleis et al., 1992). As a concept representing one's cultural background, in the study, ethnic identity was measured by questions on self-reported ethnic identity. In the study, Whites, Hispanics, Asians, and African Americans in the U.S. were each treated as a distinct ethnic group because we could not incorporate all subgroups in each ethnic group—at least 71 ethnic groups are represented among Asians in America (Ito et al., 1997). *Whites* narrowly mean a human group having light-colored skin of European ancestry, which also includes people from North Africa and the Middle East (Adams, 2001; Thompson & Hickey, 2005). *Hispanics* mean the people of Spain and everyone with origins in any of Spanish-speaking nations of the Americas, which is an ethnic indicator in the U.S. after its inclusion in the 1980 US Census (Gibson, 2002). *African*

Americans refer to members of an ethnic group in the U.S. whose ancestors are indigenous to Sub-Saharan Africa (Graves, Jr., 2006). *Asian Americans* are defined as a person of Asian ancestry who was born in or is an immigrant to the U.S. (Ohio State University, 2006): in this study, “*Asian American*” is shortened to “*Asian*” for the convenience of discussion.

Methods

For this study, a cross-sectional correlational design was used.

Settings and Participants

Using a convenience sampling method, a total of 158 middle-aged women aged 40 to 60 years who could read and write English were recruited through both Internet and community settings including 20 Internet communities/groups for midlife women that were identified through Google search, shopping malls, hair salons, and ethnic churches. The study announcement distributed and/or posted on both settings included general information about the study and information on contact numbers, e-mail address, and the dates data were collected. The reason for recruiting the participants online was to reach mid-life women from a broader geographical range nationally. The women recruited through the community settings and those recruited through the Internet settings were not statistically significantly different in their selected sociodemographic characteristics (age, education, family income, and hormone usage). Sociodemographic characteristics of the 158 women are summarized in Table 1.

With a medium effect size ($f=0.20$) and an alpha of 0.05, 120 subjects are required to achieve a power of 0.86 in ANOVA. Based on the previous studies (Grisso et al., 1999; Laferrere et al., 2002; Lovejoy et al., 2001; McCarthy, 1994; McCrohon et al., 2000; Parfitt et al., 1997; Probst-Hensch et al., 2000; Wilbur et al., 1998), a medium effect size of 0.20 was assumed in the study. Thus, the sample size of 158 is adequate to describe and explore ethnic differences in symptoms experienced during the menopausal transition.

Instruments

Both Internet and pen-and-pencil (PP) format of the questionnaires were used, depending on the recruitment settings. Both formats were comprised of self-administered questions on six sociodemographic characteristics, health, and menopausal status, and the MSI. There were no significant differences in the reliability and validity between the Internet questionnaire and the PP questionnaire (Author, 2005). Detailed information on each instrument is as follows.

Sociodemographic characteristics—The questions on sociodemographic characteristics included 8 questions on age, education, religion, marital status, employment status, family income, self-reported ethnic identity (ethnic group membership), and country of birth.

Self-reported health and menopausal status—The questions on self-reported health and menopausal status included a 5-point Likert scale item rating general health (1 item); 2 open-ended questions on diagnosed diseases and medicine (2 items); 7 items asking last menstrual cycle, menstrual regularity, and menstrual flow (7 items); and 1 question on steroid and hormone usage.

Symptoms experienced during the menopausal transition—The Midlife Women’s Symptom Index (MSI) (Im, 2006) was used to measure symptoms experienced during the menopausal transition. The MSI was developed based on the Cornell Medical Index (Brodman et al., 1956), which has a 195-item dichotomous scale and is divided into 18 sections including physiological symptoms and psychological symptoms. For the menopausal study by Im,

Meleis, & Lee (1999), the CMI was modified to include additional 14 questions on menopause specific symptoms reported in previous menopausal studies among both Western and Asian populations (Blatt et al., 1953; Im, 1994; Neugarten & Kraines, 1965), and to exclude questions on family history of diseases. Nevertheless, the modified CMI still included non-symptom questions and tended to be too long (164 items). Thus, the modified CMI was again refined based on recent studies on symptoms experienced during the menopausal transition (Avis et al., 2001; Mitchell & Woods, 1996; Sowers et al., 2003), recent menopause-specific instruments (the SWAN study instrument and the WWHD), and reviews of an expert panel (8 experts in the area of women's health), which resulted in the MSI (Im, 2006). The MSI includes a total number of 88 dichotomous items, and categorizes the items into physical, psychological, and psychosomatic.

Data Collection Procedures

The study was approved by the Internet Review Board of the institution where the researchers are affiliated. For the women who were recruited through real settings, when a potential participant contacted the researcher by phone or email, her eligibility for the study was checked. When she met the inclusion criteria, the informed consent form and the PP survey questionnaire were mailed or delivered in person to her. Then, she was asked to review and sign the consent form, self-administer the questionnaire, and return the signed consent form and the questionnaire by mail or in person. For the women who were recruited through the Internet, a project website was developed and maintained in accordance with Health Insurance Portability and Accountability Act (HIPAA) regulations on patient anonymity and the online security recommendations of the SysAdmin Audit, Network, and Security Institute and Federal Bureau of Investigations (SANS/FBI). When a potential participant visited the project website, she was asked to review the digital informed consent sheet and give her consent by clicking the button of "I agree to participate." When she clicked the button, her eligibility was checked with several screening questions related to the inclusion criteria. Then, only those who met the inclusion criteria were automatically forwarded to the Internet survey webpage and asked to fill out the questionnaire there.

Data Management and Analysis

The data were saved in ASCII format in CD ROMs, which conforms to the Statistical Package for Social Science (SPSS) data format. No individual identities were used throughout the data management and analysis process; only serial ID numbers (assigned by the researchers) were attached to the data. The data were confidentially dealt with and maintained in a locked file cabinet in a research office. If missing fields were less than 10%, the missing data were substituted with means for continuous variables and "999" for categorical variables. The data of the women for whom 10% or more data were missing and who did not enter their answer for the question on self-reported ethnic identity were not included in the data analysis.

Data were analyzed using the SPSS. Data on sociodemographic characteristics, self-reported health and menopausal status, and self-reported symptoms experienced during the menopausal transition were described using frequency, percentage, mean, standard deviation, and range. Also, total scores of the MSI were calculated and analyzed using mean and standard deviation. Then, to explore ethnic differences in symptoms experienced during the menopausal transition, the data were analyzed using ANOVA. The associations between symptoms experienced during the menopausal transition and other contextual factors were analyzed using correlation analyses, chi-square tests, and ANOVA tests. The associations between continuous variables and the total numbers of symptoms, physical symptoms, psychological symptoms, and psychosomatic symptoms (continuous variables) were analyzed using correlation analyses. The associations between categorical variables with more than two categories and the total numbers of symptoms, physical symptoms, psychological symptoms, and psychosomatic

symptoms were analyzed using ANOVA. The associations between categorical variables and each symptom included in the MSI (dichotomous variables) were analyzed using chi-square tests.

Findings

Symptoms

The mean total number of total symptoms was 23.34 ($SD=13.65$); that of physical symptoms was 13.23 ($SD=7.58$); that of psychological symptoms was 6.88 ($SD=5.65$); and that of psychosomatic symptoms was 1.83 ($SD=1.83$). The mean total number of total symptoms was 23.86 ($SD=13.75$) among White women, 31.0 ($SD=13.70$) among African American women, 17.75 ($SD=13.15$) among Asian American women, and 27.56 ($SD=13.63$) among Hispanic women. The mean total number of physical symptoms was 13.74 ($SD=7.66$) among White women, 17.0 ($SD=7.63$) among African American women, 10.15 ($SD=7.15$) among Asian American women, 13.70 ($SD=7.74$) among Hispanic women. The mean total number of psychological symptoms was 7.12 ($SD=5.80$) among White women, 5.70 ($SD=3.56$) among African American women, 5.20 ($SD=4.43$) among Asian American women, and 8.26 ($SD=6.74$) among Hispanic women. The mean total number of psychosomatic symptoms was 1.84 ($SD=1.29$) among White women, 4.00 ($SD=1.22$) among African American women, 1.40 ($SD=1.77$) among Asian American women, and 2.20 ($SD=1.03$) among Hispanic women.

The most frequently reported symptoms across ethnic groups include “allergy symptoms” (64%), “changes in vision” (61%), “feeling hot or cold” (61%), “forgetfulness” (61%), “sleep difficulty” (54%), and “stiff and sore joints” (52%). The most frequently reported symptoms according to ethnic groups are summarized in Table 2.

Ethnic Differences in Symptoms

The ANOVA tests indicated that there was no statistical significant difference in the total number of total symptoms, physical symptoms, psychological symptoms, and psychosomatic symptoms according to ethnic identity. However, the chi-square tests indicated that there were significant associations between the frequencies of the following symptoms and the ethnicity of the participants: “feeling hot or cold” ($\chi^2=22.55$, $p<.01$), “tense or jumpy during period” ($\chi^2=40.08$, $p<.01$), “hot flushes” ($\chi^2=14.42$, $p<.01$), “frequent urination” ($\chi^2=12.33$, $p<.01$), and “feeling grouchy” ($\chi^2=21.40$, $p=.01$).

Other Correlates of Symptoms

A correlation analysis indicated that there were no significant associations between age and the total number of total symptoms, physical symptoms, psychological symptoms, and psychosomatic symptoms. However, the ANOVA tests indicated that the symptoms experienced during the menopausal transition were significantly different according to several contextual variables. First, according to income satisfaction, there were significant differences in total number of total symptoms ($F=8.39$, $p<.01$) and physical symptoms ($F=8.42$, $p<.01$). Post-hoc tests could not be conducted because only two income groups had an adequate number of participants for the post-hoc comparisons. In terms of self-reported health status, there were significant differences in total number of psychological symptoms ($F=6.37$, $p<.01$). The women who reported “excellent” or “very good” health status had a lower number of psychological symptoms compared with the women who reported “fair” health status.

When chi-square tests were conducted to determine the associations between each of the symptoms included in the MSI (dichotomous variables) and categorical sociodemographic characteristics, significant associations between some symptoms and the following variables were found (please see Table 3): (a) income satisfaction; (b) education; (c) marital status; (d)

religion (having a religion, or no religion); (e) birth place (US born or non-US born); (f) employment status (employed or not-employed); (g) disease status (disease or no-disease); (h) health status; (i) medication status (currently medicated or not medicated); (j) menopausal status; and (k) hysterectomy status.

Discussions

In the study reported in this paper, the existence of certain ethnic differences in the symptoms experienced during the menopausal transition was noted. Asian women were found to experience the smallest number of total symptoms, physical, psychological, and psychosomatic symptoms compared with all other ethnic groups, a finding that agrees with previous findings among Asian women (Chim et al., 2002; Im, 1997; Lock, 2001; Pan et al., 2002). In addition, African American women were found to experience the largest number of total, physical, and psychosomatic symptoms compared with other ethnic groups.

Despite some conflicting findings on ethnic differences in specific symptoms experienced during the menopausal transition, certain ethnic variations in the symptoms have been clearly reported in relatively recent studies among ethnically diverse groups of women (Avis et al., 2001; Fu et al., 2003; Kravitz et al., 2003; Lasley et al., 2002; Lovejoy et al., 2001; McCrohon et al., 2000; Wilbur et al., 1998). In these studies, ethnic variations in vasomotor symptoms were frequently reported. Brazilian women were reported to experience highly prevalent and similar vasomotor symptoms to those reported among Western women (Pedro et al., 2003); only 12 to 20 percent of Asian women were reported to experience them (Chim et al., 2002; Im, 1997; Lock, 2001; Pan et al., 2002); and Mayan women in Mexico were reported to experience none of them at all (Beyene & Martin, 2001).

The findings reported in this paper were slightly different than those of previous studies. For example, studies among African American women reported that African American women tended to have hot flashes and vaginal dryness more than Caucasian women, but they tended to have urine leakage and difficulty sleeping less than Caucasians (Gold et al., 2000). Yet in the study reported in this paper, there were significant ethnic differences in “hot flushes” and “frequent urination,” but not in “vaginal dryness.” The most frequently reported symptoms according to ethnic groups were also different. Across the ethnic groups, “forgetfulness” and “sleep difficulty” were included as one of the most frequently reported symptoms.

As presented in the findings section, significant associations of income, education, marital status, religion, the country of birth (US born or non-US born), employment status (employed or not-employed), the disease status (disease or no-disease), health status, medication status (currently medicated or not medicated), menopausal status, and hysterectomy status to the symptoms experienced during the menopausal transition were found. These findings are similar to those of previous studies on associations of some contextual factors to symptoms experienced during the menopausal transition, although those studies tend to be limited to White women. Statistically significant correlations of symptoms experienced during the menopausal transition to multiple factors (e.g., age, educational level, socioeconomic status, employment status, number of children, diet [soy consumption], height, body size, body weight, body mass, alcohol consumption, smoking, level of physical activity, exercise, physical functioning, health status, osteoarthritis, mental illness, tubal ligation, attitudes toward menopause and aging, menopausal status, marital satisfaction, and interpersonal relationships, and usage of hormone replacement therapy and calcium supplements) have been reported in previous studies (Avis et al., 2001; Barrett-Connor et al., 2000; Brzyski et al., 2001; Chim et al., 2002; Gold et al., 2000; Ho et al., 2003; Punyahotra et al., 1997; Sommer et al., 1999; Sowers et al., 2003). Yet, the findings on the associations of contextual factors to the symptoms experienced during the menopausal transition that are reported in this paper did not include

information on ethnic-specific contextual factors circumscribing women's symptom experience during the menopausal transition because of the inherent characteristics of a quantitative study design.

Despite positive findings on ethnic differences in the symptoms experienced during the menopausal transition, the study presented in this paper has some limitations. The first limitation is related to authenticity of the Internet interactions among the participants recruited through the Internet (e.g., if the participants recruited online actually were midlife women in the ethnic group as they reported). Because Internet recruitment is based on non-face-to-face interactions, researchers working in this environment must rely heavily on the honesty of the participants, which might have resulted in bias. Second, although the participants were recruited nationally through the Internet recruitment process, the sampling could not be claimed to be a national sample of midlife women, which might raise questions about the generalizability of the study findings. Third, as mentioned above, the participants did not represent all the diverse ethnic subgroups of Whites, Hispanics, Asians, and African Americans in the U.S. Rather, in this study, Whites, Hispanics, Asians, and African Americans were treated as distinct ethnic groups for the convenience of comparisons. Fourth, because of the pilot descriptive nature of the study and the small sample size in some ethnic groups (e.g., only 13 African American women), contextual variables could not be controlled in the study. Finally, another limitation would be that there still might be some differences between the participants recruited through the Internet and those recruited through community settings although there was no statistically significant difference between the two groups identified in the study reported in this paper.

Implications and Conclusions

In the study presented in this paper, ethnic differences in symptoms experienced during the menopausal transition were explored among 158 mid-life women who were recruited through both Internet and community settings. In the study, significant ethnic differences in symptoms experienced during the menopausal transition and significant associations of contextual factors including sociodemographic characteristics, health, and menopausal status to the symptoms were found. Based on the findings, the following implications for future menopausal research and health care practice with ethnic minority mid-life women are proposed.

First, further investigations on ethnic differences in symptoms experienced during the menopausal transition among larger multi-ethnic groups of participants are essential for developing the knowledge base on ethnic differences. With such a foundation, the health care needs of ethnic minority women in the menopausal transition can be adequately and appropriately assessed.

Second, national approaches to recruit mid-life women need to be further explored and used in future research on ethnic differences in the symptoms experienced during the menopausal transition. As discussed above, a lack of national samples in menopausal studies is a major concern in research on ethnic differences in symptom experience during the menopausal transition. A larger number of multi-ethnic groups of midlife women across the nation would help develop the knowledge base on ethnic differences in the symptom experience. As the study reported in this paper indicated, Internet recruitment would make it possible for researchers to reach a large number of multi-ethnic groups of midlife women across the nation. The Internet will also allow researchers to reach midlife women in different countries for cross-cultural studies comparing the symptoms of different ethnic groups of women in different geographical areas.

Finally, further qualitative investigations on ethnic-specific contextual factors influencing symptom experience during the menopausal transition of multi-ethnic groups of women are needed. In the study presented in this paper, significant associations between contextual factors and symptoms experienced during the menopausal transition were found. However, as pointed out above, the findings could not include any information on ethnic-specific contexts within which women are experiencing symptoms because of the inherent characteristics of a quantitative study design. Without knowing ethnic-specific contexts circumscribing women's symptom experience during the menopausal transition, the health care needs of the women cannot be adequately and appropriately assessed and provided.

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Table 1

Sociodemographic Characteristics (N=158)

Characteristics	n (%)	Characteristics	n (%)	Characteristics	n (%)
Age: Mean (SD)	48.60 (5.05)	Education		Family Income	
Employment Status		Middle school	3 (1.9)	Very hard for basics	4 (2.5)
Full time	115 (72.8)	High school	10 (6.3)	Somewhat hard	27 (17.1)
Part time	24 (15.2)	College	82 (51.9)	Not very hard for basics	126 (79.7)
Not-employed	19 (12.0)	Graduate Degree	63 (39.9)	No response	1 (1.3)
Religion		Marital Status		Ethnicity	
Protestant	81 (51.3)	Married	116 (73.4)	White	94 (59.5)
Catholic	34 (21.5)	Divorced/Separated	27 (17.1)	Hispanic	23 (14.6)
Buddhism	18 (11.4)	Widowed	4 (2.5)	African American	13 (8.2)
Moslem	1 (0.6)	Single/never married	9 (5.7)	Asian	28 (17.7)
No religion	11 (7.0)				
Other	13 (8.2)				
		Hormonal Use		Born in the U.S.	
		Yes	15 (19.5)	Yes	120 (75.9)
		No	62 (80.5)	No	38 (24.1)
		Menopausal Status		Disease Status	
Health Status		Pre-menopausal	85 (53.8)	Yes	67 (42.4)
Excellent	22 (13.9)	Peri-menopausal	48 (30.4)	No	91 (57.6)
Very good	76 (48.1)	Post-menopausal	54 (34.2)		
Good	41 (25.9)	No response	1 (0.6)		
Fair	13 (8.2)				
Poor	6 (3.8)				

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Table 2

The most frequently reported symptoms among four different ethnic groups

Rank	White	African-American	Asian-American	Hispanic
1	Feeling hot or cold (72%)	Sleep difficulty (85%)	Changes in vision (79%)	Allergy symptoms (74%)
2	Allergy symptoms (65%)	Feeling hot or cold (77%) Forgetfulness (77%)	Forgetfulness (57%)	Urination during night time (65%)/Forgetfulness (65%)
3	Forgetfulness (60%)	Hot flushes (69%) Changes in vision (69%)	Allergy symptoms (50%)	Frequent urination (61%)/ Stiff and sore joints (61%)/ Worrying about body (61%)/Complete exhaustion (61%)
4	Changes in vision (60%)		Stiff and sore joints (39%)	
5	Sleep difficulty (56%)		Pain in the back of skull and neck (46%)	

Table 3

A summary of associations between individual symptoms and other correlates

Correlates	Symptoms	χ^2	P-value
Income satisfaction	“blind spots in vision”	22.42	<.01
	“eye pain”	13.38	<.01
	“sore throat”	11.83	<.01
	“difficulty in breathing”	14.88	<.01
	“badly coated tongue”	15.11	<.01
	“stomach pain”	20.72	<.01
	“constipation”	12.29	<.01
	“severe burning pain during urination”	48.38	<.01
	“frequent crying”	27.46	<.01
	“feeling suffocation”	27.46	<.01
Education	“blind spots in vision”	35.21	<.01
	“mood swing”	14.95	<.01
	“blink or watery eyes”	26.99	<.01
	“pain in eyes”	19.54	<.01
	“constant coughing”	28.13	<.01
	“feeling weak or sick during period”	34.02	<.01
	“frequent urination”	13.11	<.01
	“panicky”	26.18	<.01
Education	“feeling suffocation”	23.74	<.01
Marital Status	“difficulty in concentration”	15.37	<.01
	“feeling weak or sick during period”	34.02	<.01
	“panicky”	26.18	<.01
	“feeling suffocation”	23.74	<.01
	“blind spots in vision”	159.35	<.01
Religion	“difficulty in breathing”	18.31	<.01
	“bleeding gum”	28.85	<.01
	“badly coated tongue”	20.43	<.01
	“heavy menstruation”	60.76	<.01
	“frequent or prolonged period	161.65	<.01
	“feeling hot or cold”	17.49	<.01
	“tense or jumpy during period”	49.32	<.01
	“badly coated tongue”	16.48	<.01
Birth Place (US born or non-US born)	“feeling hot or cold”	15.60	<.01
	“tense or jumpy during period”	15.31	<.01
	“sleep difficulty”	8.25	<.01
	“weight gain”	8.83	<.01
	“heavy menstruation”	11.10	<.01
Birth Place	“discomfort during intercourse”	9.51	<.01
Employment Status	“recent weight gain”	13.99	<.01
Disease status	“difficulty in breathing”	7.40	<.01

Correlates	Symptoms	χ^2	P-value
Health Status	"stiff or sore joints"	7.03	<.01
	"back pain"	12.31	<.01
	"urination during night"	10.53	<.01
	"forgetfulness"	6.77	<.01
	"rheumatic pain"	9.16	<.01
	"forgetfulness"	13.11	<.01
	"difficulty in breathing"	20.00	<.01
	"constipation"	17.38	<.01
	"pain in the back of neck and skull"	16.77	<.01
	"feeling suffocation"	20.71	<.01
Health Status	"worrying about body"	20.71	<.01
	"blind spots in vision"	14.23	<.01
	"feeling tense"	18.12	<.01
	"bleeding between period"	28.25	<.01
Medication Status	"frequent urination"	10.17	<.01
	"sleep difficulty"	8.46	<.01
	"irritability"	7.77	<.01
	"recent weight gain"	7.50	<.01
Menopausal Status	"allergy symptoms"	8.03	<.01
	"stiff and sore joints"	10.95	<.01
	"feeling tense"	6.75	<.01
	"bad nasal bleeding"	31.16	<.01
	"difficulty in breathing"	12.36	<.01
	"painful menstruation"	76.60	<.01
	"weak or sick during period"	75.11	<.01
	"lying down during period"	80.74	<.01
	"tense or jumpy during period"	75.52	<.01
	"hot flushes"	24.52	<.01
Menopausal Status	"vaginal discharge"	12.62	<.01
	"heavy menstruation"	87.51	<.01
	"frequent or prolonged periods"	55.74	<.01
	"flooding"	45.91	<.01
	"mood swing"	4.33	<.01
	"bleeding between periods"	35.14	<.01
Hysterectomy	"painful menstruation"	21.30	<.01
	"weak or sick during period"	21.22	<.01
	"lying down during period"	21.25	<.01
	"easily upset or irritate"	6.13	<.01
	"recent weight gain"	22.23	<.01
	"flooding"	15.28	<.01