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ORIGINAL STUDY

Prevalence, severity, and associated factors in women in East Asia with moderate-to-severe vasomotor symptoms associated with menopause

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Abstract

Objective: To understand prevalence, severity, impact, and treatment of vasomotor symptoms associated with menopause, using cross-sectional survey data.

Methods: This online, two-part survey was conducted in East Asia among women 40-65 years recruited from established online panels (Edelman, Beijing; Hankook Research, Seoul; Rakuten Insight, Taipei) using stratified sampling. Part I collected demographics/disease characteristics, including menopausal status and vasomotor symptom severity. Women with moderate-to-severe vasomotor symptoms completed Part II, including clinical characteristics, health-related quality of life, and healthcare-seeking behavior. Primary endpoints included vasomotor symptom prevalence and severity and proportions of women eligible and willing to take hormone therapy. Results are presented for each of the three online panels separately and as a pooled total. All analyses are descriptive with no formal hypothesis testing across groups.

Results: Numbers of peri- versus postmenopausal women completing Part I were Edelman, 1,588 (55.1% vs 44.9%); Hankook Research, 1,000 (43.6% vs 56.4%); Rakuten Insight, 773 (61.7% vs 38.3%). Vasomotor symptom prevalence was ≈80% in each region; overall moderate-to-severe vasomotor symptom prevalence was 55%; >50% of women were untreated. Most of those treated used non-prescription treatments. Menopausal hormone therapy use was reported by 11.6% of peri- and 7.2% of postmenopausal women. In peri- and postmenopausal women with moderate-to-severe vasomotor symptoms, 8.6% and 3.4%, respectively, were hormone therapy-willing, 19.3% and 16.8% hormone therapy-contraindicated, 25.4% and 23.0% hormone therapy-cautious, and 10.2% and 8.3% hormone therapy-averse. Women experienced significant burden on health-related quality of life and substantial impairment of work productivity and daily activities.

Conclusions: Vasomotor symptoms associated with menopause affected ≈80% of women aged 40 to 65 years. A substantial proportion of women are unsuitable for, or choose not to take, menopausal hormone therapy, resulting in an unmet need for nonhormonal treatment options.

Key Words: Epidemiology – Quality of life – Treatment – Vasomotor symptoms.

Vasomotor symptoms (VMS), which include hot flashes, sweating, and night sweats, are common for many women during the perimenopausal or postmenopausal period.[1] Each of these phases is hormonally heterogenous but more consistent within each phase and even duration from final menstrual period can impact VMS frequency and severity. The prevalence of menopausal VMS has been reported to range from 43% to 84% among East Asian

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women, but few studies have used nationally representative samples.[2-4]

Menopausal VMS has been shown to negatively impact health-related quality of life (HRQoL) (eg, impairments to daily activities and work productivity), and the magnitude of this burden increases with VMS severity.[5,6] Although clinical practice guidelines recognize a continued role for hormone therapy (HT) to manage symptoms, particularly for women <60 years of age or within 10 years of menopause,[7,8] HT is associated with long-term safety concerns including the potentially increased risk of breast cancer, and an increased risk of stroke and venous thromboembolism.[9,10] In addition, many women are not eligible for HT due to contraindications or other health risks. Alternative treatment options are needed, and a number are under active research.

In Asian countries, the use of prescription treatment for menopausal VMS is limited compared with Western countries, partially due to cultural beliefs and preference for over-the-counter treatments or traditional herbal medicine.[11] More evidence is needed to understand the epidemiology of VMS associated with menopause, the impact of burden on HRQoL, and the current treatment landscape, as well as womens' healthcare-seeking behavior and key driving factors in East Asia.

The aim of this study was to understand further the prevalence, severity, impact, and treatment of VMS, using real-world, selfreported data from a cross-sectional survey in perimenopausal or postmenopausal women with VMS in East Asia.

METHODS

Study population and design

This was a non-interventional, cross-sectional, self-administered, online two-part survey conducted in East Asia among peri- and postmenopausal women aged 40 to 65 years who were recruited from established online panels. These were the Edelman online panel (Edelman, Beijing; 1,646,782 registered members), the Hankook Research Master Sample Panel (Hankook Research, Seoul; 450,621 members), and the Rakuten Insight proprietary managed panels (Rakuten Insight, Taipei; 110,000 members; see Supplemental Digital Content 1, http://links.lww.com/MENO/A924, showing the online panels). To maximize the national representativeness of the study population, a stratified sampling approach was applied in each geographical location to assemble a study population with a comparable distribution of age and geographic location with the national population. Based on the total target sample size and the age and geographic region distribution of the national populations, the study planned to recruit 2,200, 1,250, and 1,000 women for screening from the Edelman, Hankook, and Rakuten panels, respectively.

Participants who signed the Informed Consent Form were invited to answer the screening questions. The screener then assessed the eligibility of participants and assigned them to Sample 1 and/or Sample 2, primarily according to VMS severity. The self-administered questionnaire was translated into local languages for each group. The entire survey (Parts I and II) took approximately 27 minutes on average to complete.

Survey part I

Part I inclusion criteria were evidence of perimenopause (changes in the regular period in terms of irregularity in period length, time between periods, and intensity of flow), or evidence of postmenopause (spontaneous amenorrhea over 12 mo). Exclusions were participation in menopausal VMS clinical studies in the previous 6 months, or treatment with tamoxifen, aromatase inhibitors, or gonadotropin-releasing hormone agonists/antagonists for cancer or any other medical condition in the past year. Part I of the survey collected data on key demographic and characteristics, including severity of menopausal VMS.

Survey part II

Only participants with moderate-to-severe VMS, based on the US FDA 2003 Guideline criteria,[12] who had completed the Part I survey were eligible to complete Part II of the survey. Moderate VMS was defined as ``Sensation of heat with sweating, able to continue activity" and severe VMS was defined as ``Sensation of heat with sweating, causing cessation of activity. " Part II of the survey collected information on clinical characteristics, participants' eligibility and willingness to take HT, HRQoL, treatment landscape, and healthcare-seeking behavior and key driving factors.

Objectives and endpoints

The primary objective was to estimate the prevalence of menopausal VMS and moderate-to-severe VMS in perimenopausal or postmenopausal women living in East Asia, and assess their eligibility and willingness to receive HT. Menopausal VMS was defined as sensation of heat with/without sweating, based on US FDA Guidelines.[12] Primary endpoints included VMS prevalence and severity and the proportion of women self-reporting eligibility and willingness to take menopausal HT. HT subgroups among the peri- or postmenopausal women aged 40 to 65 years with moderate-to-severe menopause related VMS were defined as follows:

- HT-willing: receiving HT for menopause-related VMS.
- HT-averse: discontinued HT, or decided not to receive HT despite being HT-eligible based on clinical advice.
- HT-contraindicated: presenting with any of the following underlying conditions: abnormal or unexplained vaginal bleeding, severe active liver disease, deep vein thrombosis, endometrial/uterine cancer, ovarian cancer, stroke/angina pectoris/ myocardial infaction, other contraindications based on local clinical inputs, including breast cancer, coronary heart disease, dementia, embolism, porphyria cutanea tarda, hypertriglyceridemia, endometriosis, migraine, and leiomyosarcoma.
- HT-stoppers: had received HT but discontinued due to various reasons.

- HT-caution per physician's advice: advised by a physician that they were HT-ineligible due to contraindications or high-risk comorbidity, but did not disclose the specific condition(s).
- HT-caution due to high-risk comorbidity: presenting with any of the following risk factors: current smokers, any first-degree relatives with history of breast, endometrial/uterine or ovarian cancer, high cholesterol, hypertriglyceridemia, migraine, diabetes.

The secondary objective was to assess the burden on HRQoL, treatment landscape, and healthcare-seeking behavior and key driving factors (eg, attitude toward prescription treatments) among perimenopausal or postmenopausal women with moderate-to-severe VMS. HRQoL was measured using the Menopause-Specific Quality of Life questionnaire (MENQOL; including the vasomotor, physical, psychosocial, and sexual domains)[13] and work productivity and activity impairment surveys (including domains on absenteeism, presenteeism, total work impairment, and total activity impairment).[14] For these measures a higher score indicates worsening/impairment and the instruments used were available in the local language. Treatment landscape was assessed by hospital/clinic visiting history related to VMS and past and current treatments for VMS since diagnosis, by treatment category. Healthcare-seeking behavior and the key driving factors among participants with moderate-to- severe VMS were also assessed, including reasons for not visiting hospitals, not taking prescribed treatments, being HT- averse, choosing a treatment, and discontinuing a treatment.

Statistical methodology

The sample size for this descriptive study was based on the precision of parameters to be estimated, using the normal approximation to the binomial distribution and assuming a proportion of interest to be 50% (which has the maximum uncertainty). The proposed sample sizes that were thought to be feasible from each of the panels, that is 2,200 for Edelman, 1,250 for Hankook Research, and 1,000 for Rakuten Insight, would have a precision of 2.1%, 2.8%, and 3.1% respectively. All measurements were summarized descriptively and no statistical comparisons were made across groups. The mean (standard deviation) and median (interquartile range) were calculated for continuous variables, while counts and proportions were calculated for categorical variables. All analyses were conducted using a complete case analysis approach.

The survey included logic checks and structures that prohibited question skipping and required a response to each question before proceeding. The only items for which skipping was allowed were questions about the date of hysterectomy and salpingo-oophorectomy if any, open-ended questions for key expectations and concerns for new pharmacologic treatments, and questions regarding the specific type of comorbidity if gynecological conditions, metabolic disorders, or cardiovascular diseases and cancers were selected. Missing values for the date of surgeries and open-ended questions were omitted from the corresponding analysis. Participants who selected gynecological conditions, metabolic disorders, or cardiovascular diseases and cancers but did not select any specific type of comorbidity were grouped into the ``others'' subcategory.

RESULTS

Participants and demographics

The study recruited a total of 4,754 women; distribution by region and survey group are shown in Supplemental Digital Content 2, http://links.lww.com/MENO/A925, regarding survey participants. Mean age was 47.5 for peri- and 58.1 for postmenopausal women (Table 1). The distribution of age and region in the recruited study population was generally comparable to the overall statistics of national population in each geographical location.

Prevalence

The prevalence of VMS associated with menopause was $=$80% in each geographical location (Table 2). In the Edelman panel, perimenopausal women had a higher prevalence of VMS (94.5%) versus postmenopausal women (78.1%), and in the Hankook panel perimenopausal women had a lower prevalence of VMS (69.0%) vs. postmenopausal women (78.5%). VMS prevalence was similar between peri- (75.1%) and postmenopausal (75.3%) women in the Rakuten panels.

Overall, the prevalence of moderate-to-severe VMS was 55%, which included 49% who had moderate VMS and 7% who had severe VMS. Furthermore, 25% of women had mild VMS (Table 2). The proportion of women with severe VMS was notably higher in the Edelman panel than the Hankook panel and the Rakuten panels, and in the Edelman panel a higher proportion of perimenopausal women had moderate-to-severe VMS than postmenopausal women.

Burden on HRQoL among peri- or postmenopausal women with moderate-to-severe VMS

A significant burden on HRQoL was reflected in all four domains of the MENQOL, as $>$70% of each group experienced vasomotor, psychosocial, or physical symptoms and $>$50% reported burden on the sexual domain (Table 3). The most bothersome symptoms were sweating (affecting 65.3% and 69.6% of perimenopausal and postmenopausal women, respectively), night sweats (65.7% and 63.2%), feeling tired or worn out (60.6% and 62.0%), poor memory (60.5% and 63.7%), hot flashes (59.1% and 63.0%), and decrease in physical strength (57.5% and 63.7%). In the Edelman panel, night sweats were considered the most common and bothersome symptom, affecting 66.4% and 67.4% of peri- and postmenopausal women with moderate-to-severe VMS, respectively. In the Hankook panel, feeling tired or worn out was the most bothersome symptom, affecting 92.8% and 83.2%, respectively; and in the Rakuten panels the most

TABLE 1. *Respondent demographics by population*

	Edelman panel		Hankook panel		Rakuten panels		Pooled analysis	
	Perimenopausal (*n* = 875)	Postmenopausal (n = 713)	Perimenopausal (n = 436)	Postmenopausal (n = 564)	Perimenopausal (n = 477)	Postmenopausal (n = 296)	Perimenopausal (n = 1,788)	Postmenopausal (n = 1,573)
Age (y), mean (SD)	47.6 (4.0)	58.9 (4.0)	47.4 (4.1)	58.1 (4.7)	47.2 (4.1)	55.9 (4.9)	47.5 (4.0)	58.1 (4.6)
Median (IQR)	47.5 (6.0)	59.0 (7.0)	46.9 (6.0)	59.3 (6.7)	46.6 (6.5)	56.1 (7.0)	47.2 (6.2)	58.4 (7.0)
Height (cm), mean (SD)	162.7 (4.6)	161.2 (5.3)	160.7 (4.7)	158.5 (4.9)	159.5 (5.2)	158.5 (5.4)	161.4 (5.0)	159.8 (5.5)
Median (IQR)	163.0 (5.0)	160.0 (7.0)	160.0 (6.0)	158.0 (7.0)	160.0 (7.0)	158.0 (7.0)	161.0 (7.0)	160.0 (7.0)
Weight (kg), mean (SD)	57.1 (6.8)	56.5 (7.3)	58.1 (9.1)	57.3 (8.1)	58.3 (9.9)	56.6 (9.7)	57.6 (8.2)	56.8 (8.1)
Median (IQR)	56.0 (8.0)	55.0 (10.0)	57.0 (13.0)	57.0 (10.0)	57.0 (12.0)	55.0 (12.0)	56.0 (10.0)	56.0 (10.0)
Marital status, *N* (%)								
Single (never married)	5 (0.6%)	2 (0.3%)	50 (11.5%)	35 (6.2%)	163 (34.2%)	66 (22.3%)	218 (12.2%)	103 (6.5%)
Married/domestic partnership	822 (93.9%)	623 (87.4%)	354 (81.2%)	457 (81.0%)	284 (59.5%)	177 (59.8%)	1,460 (81.7%)	1,257 (79.9%)
Widowed	24 (2.7%)	51 (7.2%)	6 (1.4%)	25 (4.4%)	3 (0.6%)	15 (5.1%)	33 (1.8%)	91 (5.8%)
Divorced	22 (2.5%)	27 (3.8%)	23 (5.3%)	42 (7.4%)	23 (4.8%)	32 (10.8%)	68 (3.8%)	101 (6.4%)
Separated	2 (0.2%)	10 (1.4%)	3 (0.7%)	5 (0.9%)	4 (0.8%)	6 (2.0%)	9 (0.5%)	21 (1.3%)
Highest level of education, N (%)								
Less than a high-school diploma	118 (13.5%)	200 (28.1%)	3 (0.7%)	12 (2.1%)	4 (0.8%)	19 (6.4%)	125 (7.0%)	231 (14.7%)
High-school degree or equivalent	255 (29.1%)	282 (39.6%)	101 (23.2%)	185 (32.8%)	82 (17.2%)	85 (28.7%)	438 (24.5%)	552 (35.1%)
Bachelor's degree	474 (54.2%)	215 (30.2%)	290 (66.5%)	310 (55.0%)	316 (66.2%)	156 (52.7%)	1,080 (60.4%)	681 (43.3%)
Master's degree or above	28 (3.2%)	16 (2.2%)	42 (9.6%)	57 (10.1%)	75 (15.7%)	36 (12.2%)	145 (8.1%)	109 (6.9%)
Employment status, N (%)								
Paid employee[a]	764 (87.3%)	218 (30.6%)	268 (61.5%)	276 (48.9%)	401 (84.1%)	182 (61.5%)	1,433 (80.1%)	676 (43.0%)
Housewife	93 (10.6%)	192 (26.9%)	153 (35.1%)	234 (41.5%)	44 (9.2%)	47 (15.9%)	290 (16.2%)	473 (30.1%)
Retired	14 (1.6%)	292 (41.0%)	1 (0.2%)	39 (6.9%)	12 (2.5%)	57 (19.3%)	27 (1.5%)	388 (24.7%)
Unemployed	4 (0.5%)	11 (1.5%)	14 (3.2%)	15 (2.7%)	20 (4.2%)	10 (3.4%)	38 (2.1%)	36 (2.3%)
Household income per month for the past year, N (%)								
Median income category	15,001-18,000 CNY	12,001-15,000 CNY	4,300,001-5, 100,000 KRW	3,600,001-4, 300,000 KRW	80,001-90,000 TWD	70,001-80,000 TWD	-	-
Smoking status, N (%)								
Never smoker	793 (90.6%)	550 (77.1%)	364 (83.5%)	506 (89.7%)	416 (87.2%)	263 (88.9%)	1,573 (88.0%)	1,319 (83.9%)
Former smoker	75 (8.6%)	103 (14.4%)	49 (11.2%)	29 (5.1%)	35 (7.3%)	20 (6.8%)	159 (8.9%)	152 (9.7%)
Current smoker	7 (0.8%)	60 (8.4%)	23 (5.3%)	29 (5.1%)	26 (5.5%)	13 (4.4%)	56 (3.1%)	102 (6.5%)
Area of residency, N (%)								
Urban area	824 (94.2%)	615 (86.3%)	411 (94.3%)	534 (94.7%)	408 (85.5%)	259 (87.5%)	1,643 (91.9%)	1,408 (89.5%)
Rural area	51 (5.8%)	98 (13.7%)	25 (5.7%)	30 (5.3%)	69 (14.5%)	37 (12.5%)	145 (8.1%)	165 (10.5%)

cm, centimeter; CNY, Chinese yuan renminbi; IQR, interquartile range; kg, kilogram; KRW, Korean won; SD, standard deviation; TWD, New Taiwan dollar.
[a]Includes the self-employed.

TABLE 2. *Prevalence and severity of menopausal VMS among perimenopausal or postmenopausal women*

	Edelman panel		Hankook panel		Rakuten panels		Pooled analysis	
	Perimenopausal (*n* = 875)	Postmenopausal (n = 713)	Perimenopausal (n = 436)	Postmenopausal (n = 564)	Perimenopausal (n = 477)	Postmenopausal (n = 296)	Perimenopausal (n = 1,788)	Postmenopausal (n = 1,573)
Presence of menopausal VMS,[a,b,c] N (%)	827 (94.5%)	557 (78.1%)	301 (69.0%)	443 (78.5%)	358 (75.1%)	223 (75.3%)	1,486 (83.1%)	1,223 (77.7%)
95% CI	[92.8%-95.8%]	[74.9%-81.0%]	[64.5%-73.2%]	[74.9%-81.7%]	[71.0%-78.7%]	[70.1%-79.9%]	[81.3%-84.8%]	[75.6%-79.7%]
Prevalence of moderate-to-severe menopausal VMS,[a,b,c] N (%)	581 (66.4%)	384 (53.9%)	189 (43.3%)	301 (53.4%)	237 (49.7%)	173 (58.4%)	1,007 (56.3%)	858 (54.5%)
95% CI Severity of menopausal VMS[a,b,c,d]	[63.2%-69.5%]	[50.2%-57.5%]	[38.8%-48.1%]	[49.2%-57.5%]	[45.2%-54.2%]	[52.7%-63.9%]	[54.0%-58.6%]	[52.1%-57.0%]
Mild, *N* (%)	246 (29.7%)	173 (31.1%)	112 (37.2%)	142 (32.1%)	121 (33.8%)	50 (22.4%)	479 (32.2%)	365 (29.8%)
95% CI	[26.7%-33.0%]	[27.3%-35.0%]	[31.9%-42.8%]	[27.9%-36.6%]	[29.1%-38.9%]	[17.4%-28.4%]	[29.9%-34.7%]	[27.3%-32.5%]
Moderate, N (%)	472 (57.1%)	301 (54.0%)	184 (61.1%)	285 (64.3%)	230 (64.2%)	170 (76.2%)	886 (59.6%)	756 (61.8%)
95% CI	[53.7%-60.4%]	[49.9%-58.1%]	[55.5%-66.5%]	[59.7%-68.7%]	[59.1%-69.1%]	[70.1%-81.4%]	[57.1%-62.1%]	[59.1%-64.5%]
Severe, N (%)	109 (13.2%)	83 (14.9%)	5 (1.7%)	16 (3.6%)	7 (2.0%)	3 (1.3%)	121 (8.1%)	102 (8.3%)
95% CI	[11.0%-15.7%]	[12.2%-18.1%]	[0.6%-4.0%]	[2.2%-5.9%]	[0.9%-4.1%]	[0.3%-4.1%]	[6.9%-9.7%]	[6.9%-10.0%]

CI, confidence interval; VMS, vasomotor symptoms.
[a]Menopausal VMS was defined as sensation of heat with/without sweating, based on US FDA guidelines.[12]
[b]Prevalence was estimated among participants who were confirmed as peri- or postmenopausal, and who had completed the Part I survey (regardless of whether they completed the Part II survey).
[c]The 95% CI for the prevalence estimation was calculated using the Agresti-Coull method, which assumed an underlying binomial distribution.
[d]Severity of menopausal VMS was based on US FDA Guidelines.[12]

common and bothersome symptom was decrease in physical strength (74.2% and 68.9%), respectively.

Consistent with the MENQOL findings, impairment of participants' perception of work productivity and daily activities due to moderate-to-severe menopausal VMS was substantial. Productivity loss (considering absenteeism and presenteeism) due to moderate-to-severe VMS was highest in the Edelman panel, followed by the Hankook panel, then the Rakuten panels among women with either full-time or part-time paid employment (Table 4). Furthermore, the mean percentages of total work impairment and total activity impairment were higher in perimenopausal than postmenopausal women across all three regions.

Clinical characteristics in peri- or postmenopausal women with moderate-to-severe VMS

The mean self-reported age of first menstruation across these groups was ~14.0 years and the mean age at last menstruation in the overall population was 49.5 years. The majority of peri- or postmenopausal women in the Edelman panel had one (56%) or two children (36%), while over half in the Hankook panel had three or more children. In contrast to the Edelman panel and the Hankook panel, a high proportion of participants in the Rakuten panels (40.8% of peri- and 32.9% of postmenopausal women) did not have any children.

Overall, a higher proportion of postmenopausal than perimenopausal women had undergone hysterectomy (9.4% vs 1.0%) or salpingo-oophorectomy (3.7% vs 2.4%). The prevalence of comorbidities varied, with the proportion of those with gynecological conditions, anemia, and depression being consistently higher among peri- versus postmenopausal women, and the proportion with metabolic disorders or cardiovascular diseases, cancer, and osteoporosis being consistently higher among postmenopausal women. While the sample size was limited, the observed prevalence of comorbidities also varied by geographical region. Compared with the Edelman panel and the Rakuten panels, the prevalence of fibroids was lower in the Hankook panel, while the prevalence of abnormal or unexplained vaginal bleeding, pelvic pain, and endometriosis was higher. Among those with metabolic disorders or cardiovascular diseases, hypertension was the most prevalent condition among peri- or postmenopausal women in the Edelman panel, while high cholesterol was the most prevalent condition in the Rakuten panels. In the Hankook panel, hypertriglyceridemia was the most prevalent condition among perimenopausal women and hypertension among postmenopausal women.

Treatment landscape, healthcare-seeking behavior, and key driving factors among peri- or postmenopausal women with moderate-to-severe VMS

More women in the Edelman panel had visited hospitals or clinics to seek care for VMS compared with the Hankook panel and the Rakuten panels (Table 5). Undertreatment was a common issue in the pooled analysis, with >50% of all women with moderate-to-severe VMS remaining untreated

TABLE 3. *Burden on HRQoL among peri- or postmenopausal women with moderate-to-severe VMS: MENQOL*

	Edelman panel		Hankook panel		Rakuten panels		Pooled analysis	
	Perimenopausal (*n* = 568)	Postmenopausal (*n* = 368)	Perimenopausal (*n* = 181)	Postmenopausal (*n* = 285)	Perimenopausal (n = 233)	Postmenopausal (n = 167)	Perimenopausal (n = 982)	Postmenopausal (n = 820)
Vasomotor, *N* (%)[a]	467 (82.2%)	319 (86.7%)	173 (95.6%)	256 (89.8%)	180 (77.3%)	116 (69.5%)	820 (83.5%)	691 (84.3%)
Median (IQR)	3.3 (3.0)	3.3 (3.0)	4.7 (3.0)	4.3 (3.0)	2.7 (3.0)	2.3 (3.0)	3.3 (3.0)	3.7 (3.3)
Hot flashes	311 (54.8%)	222 (60.3%)	137 (75.7%)	204 (71.6%)	132 (56.7%)	91 (54.5%)	580 (59.1%)	517 (63.0%)
Night sweats	377 (66.4%)	248 (67.4%)	135 (74.6%)	188 (66.0%)	133 (57.1%)	82 (49.1%)	645 (65.7%)	518 (63.2%)
Sweating	353 (62.1%)	240 (65.2%)	158 (87.3%)	240 (84.2%)	130 (55.8%)	91 (54.5%)	641 (65.3%)	571 (69.6%)
Psychosocial, N (%)[a]	439 (77.3%)	308 (83.7%)	177 (97.8%)	266 (93.3%)	214 (91.8%)	139 (83.2%)	830 (84.5%)	713 (87.0%)
Median (IQR)	2.1 (2.0)	2.3 (2.3)	4.7 (3.0)	3.9 (3.4)	2.7 (2.6)	2.1 (2.0)	2.6 (2.4)	2.6 (3.0)
Dissatisfaction with personal life	162 (28.5%)	137 (37.2%)	129 (71.3%)	174 (61.1%)	103 (44.2%)	62 (37.1%)	394 (40.1%)	373 (45.5%)
Feeling anxious or nervous	215 (37.9%)	163 (44.3%)	132 (72.9%)	184 (64.6%)	123 (52.8%)	80 (47.9%)	470 (47.9%)	427 (52.1%)
Poor memory	262 (46.1%)	182 (49.5%)	153 (84.5%)	235 (82.5%)	179 (76.8%)	105 (62.9%)	594 (60.5%)	522 (63.7%)
Accomplishing less than used to	200 (35.2%)	151 (41.0%)	128 (70.7%)	194 (68.1%)	112 (48.1%)	78 (46.7%)	440 (44.8%)	423 (51.6%)
Feeling depressed, down or blue	197 (34.7%)	133 (36.1%)	141 (77.9%)	194 (68.1%)	106 (45.5%)	67 (40.1%)	444 (45.2%)	394 (48.0%)
Being impatient with other people	219 (38.6%)	158 (42.9%)	135 (74.6%)	182 (63.9%)	139 (59.7%)	80 (47.9%)	493 (50.2%)	420 (51.2%)
Wanting to be alone	176 (31.0%)	141 (38.3%)	141 (77.9%)	193 (67.7%)	122 (52.4%)	67 (40.1%)	439 (44.7%)	401 (48.9%)
Physical, *N* (%)[a]	446 (78.5%)	319 (86.7%)	179 (98.9%)	279 (97.9%)	218 (93.6%)	148 (88.6%)	843 (85.8%)	746 (91.0%)
Median (IQR)	2.1 (1.9)	1.9 (1.8)	5.0 (2.5)	4.4 (2.8)	2.8 (2.0)	2.4 (1.9)	2.6 (2.5)	2.8 (2.9)
Flatulence (wind) or gas pains	161 (28.3%)	107 (29.1%)	126 (69.6%)	173 (60.7%)	109 (46.8%)	62 (37.1%)	396 (40.3%)	342 (41.7%)
Aching in muscles and joints	235 (41.4%)	156 (42.4%)	147 (81.2%)	225 (78.9%)	142 (60.9%)	89 (53.3%)	524 (53.4%)	470 (57.3%)
Feeling tired or worn out	261 (46.0%)	168 (45.7%)	168 (92.8%)	237 (83.2%)	166 (71.2%)	103 (61.7%)	595 (60.6%)	508 (62.0%)
Difficulty sleeping	249 (43.8%)	174 (47.3%)	137 (75.7%)	209 (73.3%)	121 (51.9%)	84 (50.3%)	507 (51.6%)	467 (57.0%)
Aches in back of neck or head	166 (29.2%)	102 (27.7%)	148 (81.8%)	210 (73.7%)	146 (62.7%)	97 (58.1%)	460 (46.8%)	409 (49.9%)
Decrease in physical strength	237 (41.7%)	176 (47.8%)	155 (85.6%)	231 (81.1%)	173 (74.2%)	115 (68.9%)	565 (57.5%)	522 (63.7%)
Decrease in stamina	205 (36.1%)	153 (41.6%)	142 (78.5%)	215 (75.4%)	137 (58.8%)	90 (53.9%)	484 (49.3%)	458 (55.9%)
Feeling a lack of energy	248 (43.7%)	170 (46.2%)	151 (83.4%)	223 (78.2%)	136 (58.4%)	88 (52.7%)	535 (54.5%)	481 (58.7%)
Dry skin	216 (38.0%)	127 (34.5%)	143 (79.0%)	226 (79.3%)	151 (64.8%)	96 (57.5%)	510 (51.9%)	449 (54.8%)
Increased facial hair	80 (14.1%)	68 (18.5%)	78 (43.1%)	111 (38.9%)	24 (10.3%)	14 (8.4%)	182 (18.5%)	193 (23.5%)
Weight gain	130 (22.9%)	114 (31.0%)	144 (79.6%)	199 (69.8%)	134 (57.5%)	73 (43.7%)	408 (41.5%)	386 (47.1%)
Changes in appearance, texture or tone of skin	162 (28.5%)	136 (37.0%)	154 (85.1%)	230 (80.7%)	140 (60.1%)	90 (53.9%)	456 (46.4%)	456 (55.6%)
Feeling bloated	150 (26.4%)	87 (23.6%)	150 (82.9%)	194 (68.1%)	94 (40.3%)	57 (34.1%)	394 (40.1%)	338 (41.2%)
Low backache	215 (37.9%)	134 (36.4%)	142 (78.5%)	208 (73.0%)	94 (40.3%)	58 (34.7%)	451 (45.9%)	400 (48.8%)
Frequent urination	170 (29.9%)	117 (31.8%)	130 (71.8%)	216 (75.8%)	105 (45.1%)	71 (42.5%)	405 (41.2%)	404 (49.3%)
Involuntary urination when laughing or coughing	108 (19.0%)	85 (23.1%)	118 (65.2%)	176 (61.8%)	80 (34.3%)	50 (29.9%)	306 (31.2%)	311 (37.9%)
Sexual, *N* (%)[a]	295 (51.9%)	226 (61.4%)	148 (81.8%)	245 (86.0%)	134 (57.5%)	109 (65.3%)	577 (58.8%)	580 (70.7%)
Median (IQR)	1.7 (2.3)	2.0 (3.0)	4.0 (3.3)	4.3 (4.3)	1.7 (2.7)	2.0 (2.3)	2.0 (3.0)	2.7 (4.0)
Change in sexual desire	221 (38.9%)	172 (46.7%)	134 (74.0%)	221 (77.5%)	108 (46.4%)	85 (50.9%)	463 (47.1%)	478 (58.3%)
Vaginal dryness during intercourse	204 (35.9%)	177 (48.1%)	123 (68.0%)	220 (77.2%)	106 (45.5%)	85 (50.9%)	433 (44.1%)	482 (58.8%)
Avoiding intimacy	170 (29.9%)	135 (36.7%)	127 (70.2%)	204 (71.6%)	88 (37.8%)	67 (40.1%)	385 (39.2%)	406 (49.5%)
Overall score, mean (SD)[b]	2.7 (1.3)	3.0 (1.6)	4.4 (1.5)	4.2 (1.6)	2.9 (1.4)	2.7 (1.2)	3.1 (1.5)	3.3 (1.7)
Median (IQR)	2.5 (2.1)	2.5 (1.8)	4.5 (2.2)	4.2 (2.6)	2.6 (2.0)	2.4 (1.5)	2.9 (2.3)	2.9 (2.5)

HRQoL, health-related quality of life; IQR, interquartile range; MENQOL, Menopause-Specific Quality of Life; SD, standard deviation; VMS, vasomotor symptoms.

[a]The item score, ranging from 1-8, was derived from participants' response to each item. The domain scores were calculated as the average of item scores of each domain for each participant first before being summarized among all participants. Higher scores indicate greater extent of bother by menopausal symptoms.

[b]Overall MENQOL score calculated as the average of the domain means for each participant first before being summarized among all participants.

TABLE 4. *Burden on HRQoL among peri- or postmenopausal women with moderate-to-severe VMS: WPAI*

	Edelman panel		Hankook panel		Rakuten panels		Pooled analysis	
	Perimenopausal (n = 568)	Postmenopausal (n = 368)	Perimenopausal (n = 181)	Postmenopausal (n = 285)	Perimenopausal (n = 233)	Postmenopausal (n = 167)	Perimenopausal (n = 982)	Postmenopausal (n = 820)
Absenteeism, *n*	493	136	112	128	196	104	801	368
Mean % impairment (SD)	10.9 (13.5)	10.6 (14.9)	2.8 (7.8)	2.8 (7.5)	2.4 (6.2)	2.8 (8.1)	7.7 (12.1)	5.7 (11.6)
Hours missed from work	493	136	112	128	196	104	801	368
due to VMS Mean % impairment (SD)	4.0 (5.6)	4.7 (7.6)	1.2 (3.2)	1.1 (3.2)	1.0 (2.8)	1.2 (3.7)	2.9 (5.0)	2.5 (5.6)
Hours actually at work, *n*	493	136	112	128	196	104	801	368
Mean % impairment (SD)	36.8 (14.0)	36.0 (10.5)	40.8 (9.5)	37.4 (12.3)	39.8 (10.0)	38.3 (11.7)	38.1 (12.6)	37.1 (11.5)
Presenteeism, *n*	483	134	112	126	192	104	787	364
Mean % impairment (SD)	52.3 (23.7)	48.0 (24.4)	39.3 (24.9)	31.5 (25.8)	18.2 (22.1)	17.0 (21.4)	42.1 (27.5)	33.4 (27.1)
Total work impairment, *n*	483	134	112	126	192	104	787	364
Mean % impairment (SD)	56.4 (24.6)	51.4 (25.4)	40.9 (25.2)	32.8 (26.6)	19.7 (23.0)	18.7 (22.6)	45.2 (28.8)	35.6 (28.3)
Total activity impairment, *n*	568	368	181	285	233	167	982	820
Mean % impairment (SD)	53.2 (25.1)	48.7 (25.9)	38.3 (24.2)	35.6 (24.8)	18.8 (21.4)	16.9 (20.3)	42.3 (28.0)	37.7 (27.2)

HRQoL, health-related quality of life; SD, standard deviation; VMS, vasomotor symptoms; WPAI, work productivity and activity impairment.

across the three geographical locations (54.4% of peri- and 61.3% of postmenopausal women in the pooled analysis). The lowest treatment rate was observed in the Rakuten panels, with only 26.6% and 29.3% of peri- and postmenopausal women having ever received treatment for moderate-to- severe VMS, respectively.

More participants with moderate-to-severe VMS relied on non-prescription versus prescription treatments, with 44.3% of peri- and 35.7% of postmenopausal women having ever received non-prescription treatment compared with 15.0% and 8.8%, respectively, having ever received prescription treatments. In the Edelman panel, mind/body alternatives, and botanical, traditional medicine/herbal products were the most popular non-prescription treatments. In the Hankook panel, nutrition supplements or functional foods were the most popular non-prescription treatment for VMS, and in the Rakuten panels, participants reported a similar preference for non-prescription treatments for VMS.

Disease awareness, safety concerns, and effectiveness of symptom management were the key factors driving care-seeking behavior among participants with moderate-to-severe VMS (Supplemental Digital Content 3, http://links.lww.com/MENO/A926, describing participants' behaviors and drivers). Over 70% of participants who did not seek prescription treatment were not aware of the long-term health risks, and most participants were willing to take prescription treatment if informed about the risk. Physician recommendation was the predominant factor underlying the selection of prescription treatments, while safety was the major driver of avoidance/discontinuation of prescription treatment, including HT.

The risk of breast or ovarian cancer was given as the most prominent safety concern for being averse to HT. In addition, headaches, concerns about side effects in general, and development of breast or ovarian cancer were the predominant issues linked to discontinuation of HT in the Edelman, Hankook, and Rakuten panels, respectively (Supplemental Digital Content 3, http://links.lww.com/MENO/A926).

The majority of participants reported being willing to try novel non-HT treatments (selective serotonin reuptake inhibitors/ serotonin and norepinephrine reuptake inhibitors, gabapentin, pregabalin, or clonidine). However, reimbursement for novel treatment moderately influenced the results in the Hankook panel, with the proportion willing to try novel non-HT treatment dropping from 74% to 59% if not reimbursed (Supplemental Digital Content 3, http://links.lww.com/MENO/A926).

Although HT was the most commonly used prescription treatment for moderate-to-severe VMS, only 10% overall had ever used HT (Table 5). Participants were predominantly HT- ineligible due to contraindications or HT-caution. The HT caution group comprised women who were HT-caution according to their physician's advice (women who were advised by a physician that they were ineligible due to unspecified contraindications or high-risk comorbidities) or due to high-risk comorbidities (women who were

TABLE 5. *Treatment landscape and HT eligibility and willingness among peri- or postmenopausal women with moderate-to-severe VMS*

	Edelman panel		Hankook panel		Rakuten panels		Pooled analysis	
	Perimenopausal (*n* = 568)	Postmenopausal (*n* = 368)	Perimenopausal (*n* = 181)	Postmenopausa (*n* = 285)	Perimenopausal (*n* = 233)	Postmenopausal (n = 167)	Perimenopausal (n = 982)	Postmenopausal (n = 820)
Ever visited hospitals/clinics for VMS, N (%)[a]	373 (65.7%)	154 (41.8%)	25 (13.8%)	66 (23.2%)	34 (14.6%)	39 (23.4%)	432 (44.0%)	259 (31.6%)
Treatment use, *N* (%)								
Ever received treatment for VMS	320 (56.3%)	150 (40.8%)	66 (36.5%)	118 (41.4%)	62 (26.6%)	49 (29.3%)	448 (45.6%)	317 (38.7%)
Currently on treatment for VMS	294 (51.8%)	133 (36.1%)	48 (26.5%)	79 (27.7%)	46 (19.7%)	25 (15.0%)	388 (39.5%)	237 (28.9%)
Discontinued treatment for VMS	26 (4.6%)	17 (4.6%)	18 (9.9%)	39 (13.7%)	16 (6.9%)	24 (14.4%)	60 (6.1%)	80 (9.8%)
Prescription therapies								
Ever received treatment for VMS	133 (23.4%)	27 (7.3%)	6 (3.3%)	35 (12.3%)	8 (3.4%)	10 (6.0%)	147 (15.0%)	72 (8.8%)
Currently on treatment for VMS	93 (16.4%)	20 (5.4%)	6 (3.3%)	15 (5.3%)	3 (1.3%)	3 (1.8%)	102 (10.4%)	38 (4.6%)
Discontinued treatment for VMS	40 (7.0%)	7 (1.9%)	0 (0.0%)	20 (7.0%)	5 (2.1%)	7 (4.2%)	45 (4.6%)	34 (4.1%)
HT[b]								
Ever received treatment for VMS	101 (17.8%)	18 (4.9%)	6 (3.3%)	32 (11.2%)	7 (3.0%)	9 (5.4%)	114 (11.6%)	59 (7.2%)
Currently on treatment for VMS	75 (13.2%)	11 (3.0%)	6 (3.3%)	14 (4.9%)	3 (1.3%)	3 (1.8%)	84 (8.6%)	28 (3.4%)
Discontinued treatment for VMS	26 (4.6%)	7 (1.9%)	0 (0.0%)	18 (6.3%)	4 (1.7%)	6 (3.6%)	30 (3.1%)	31 (3.8%)
HT status								
HT-willing[c]	75 (13.2%)	11 (3.0%)	6 (3.3%)	14 (4.9%)	3 (1.3%)	3 (1.8%)	84 (8.6%)	28 (3.4%)
HT-averse[d]	90 (15.8%)	35 (9.5%)	5 (2.8%)	22 (7.7%)	5 (2.1%)	11 (6.6%)	100 (10.2%)	68 (8.3%)
HT-contraindicated[e,f]	87 (15.3%)	43 (11.7%)	50 (27.6%)	54 (18.9%)	53 (22.7%)	41 (24.6%)	190 (19.3%)	138 (16.8%)
HT-stoppers[g]	26 (4.6%)	7 (1.9%)	0 (0.0%)	18 (6.3%)	4 (1.7%)	6 (3.6%)	30 (3.1%)	31 (3.8%)
HT-caution	148 (26.1%)	73 (19.8%)	39 (21.5%)	71 (24.9%)	62 (26.6%)	45 (26.9%)	249 (25.4%)	189 (23.0%)
HT-caution per physician's advice[h]	99 (17.4%)	26 (7.1%)	3 (1.7%)	3 (1.1%)	1 (0.4%)	3 (1.8%)	103 (10.5%)	32 (3.9%)
HT-caution due to high risk comorbidity[f,i]	49 (8.6%)	47 (12.8%)	36 (19.9%)	68 (23.9%)	61 (26.2%)	42 (25.1%)	146 (14.9%)	157 (19.1%)
Non-HT prescription treatments[j]								
Ever received treatment for VMS	71 (12.5%)	17 (4.6%)	1 (0.6%)	5 (1.8%)	2 (0.9%)	2 (1.2%)	74 (7.5%)	24 (2.9%)
Currently on treatment for VMS	30 (5.3%)	12 (3.3%)	1 (0.6%)	1 (0.4%)	1 (0.4%)	0 (0.0%)	32 (3.3%)	13 (1.6%)
Discontinued treatment for VMS	41 (7.2%)	5 (1.4%)	0 (0.0%)	4 (1.4%)	1 (0.4%)	2 (1.2%)	42 (4.3%)	11 (1.3%)
Non-prescription treatments (eg, OTC and alternative therapies)								
Ever received treatment for VMS	312 (54.9%)	144 (39.1%)	65 (35.9%)	102 (35.8%)	58 (24.9%)	47 (28.1%)	435 (44.3%)	293 (35.7%)
Currently on treatment for VMS	279 (49.1%)	126 (34.2%)	47 (26.0%)	70 (24.6%)	44 (18.9%)	23 (13.8%)	370 (37.7%)	219 (26.7%)
Discontinued treatment for VMS	33 (5.8%)	18 (4.9%)	18 (9.9%)	32 (11.2%)	14 (6.0%)	24 (14.4%)	65 (6.6%)	74 (9.0%)
Botanical, traditional medicine or herbal products[k]								
Ever received treatment for VMS	161 (28.3%)	67 (18.2%)	13 (7.2%)	33 (11.6%)	14 (6.0%)	17 (10.2%)	188 (19.1%)	117 (14.3%)
Currently on treatment for VMS	113 (19.9%)	49 (13.3%)	9 (5.0%)	18 (6.3%)	7 (3.0%)	2 (1.2%)	129 (13.1%)	69 (8.4%)
Discontinued treatment for VMS	48 (8.5%)	18 (4.9%)	4 (2.2%)	15 (5.3%)	7 (3.0%)	15 (9.0%)	59 (6.0%)	48 (5.9%)
Soy isoflavone or other soy-related products								
Ever received treatment for VMS	91 (16.0%)	46 (12.5%)	18 (9.9%)	37 (13.0%)	27 (11.6%)	21 (12.6%)	136 (13.8%)	104 (12.7%)
Currently on treatment for VMS	53 (9.3%)	23 (6.3%)	12 (6.6%)	23 (8.1%)	19 (8.2%)	8 (4.8%)	84 (8.6%)	54 (6.6%)
Discontinued treatment for VMS	38 (6.7%)	23 (6.3%)	6 (3.3%)	14 (4.9%)	8 (3.4%)	13 (7.8%)	52 (5.3%)	50 (6.1%)
Nutrition supplements or functional foods[l]								
Ever received treatment for VMS	118 (20.8%)	55 (14.9%)	58 (32.0%)	75 (26.3%)	21 (9.0%)	16 (9.6%)	197 (20.1%)	146 (17.8%)
Currently on treatment for VMS	85 (15.0%)	39 (10.6%)	38 (21.0%)	52 (18.2%)	12 (5.2%)	7 (4.2%)	135 (13.7%)	98 (12.0%)
Discontinued treatment for VMS	33 (5.8%)	16 (4.3%)	20 (11.0%)	23 (8.1%)	9 (3.9%)	9 (5.4%)	62 (6.3%)	48 (5.9%)
Mind/body alternatives[m]								
Ever received treatment for VMS	174 (30.6%)	77 (20.9%)	16 (8.8%)	20 (7.0%)	27 (11.6%)	13 (7.8%)	217 (22.1%)	110 (13.4%)
Currently on treatment for VMS	141 (24.8%)	55 (14.9%)	8 (4.4%)	10 (3.5%)	20 (8.6%)	6 (3.6%)	169 (17.2%)	71 (8.7%)
Discontinued treatment for VMS	33 (5.8%)	22 (6.0%)	8 (4.4%)	10 (3.5%)	7 (3.0%)	7 (4.2%)	48 (4.9%)	39 (4.8%)
Other non-prescription treatments[n]								

(Continued on next page)

TABLE 5 *(Continued)*

	Edelman panel		Hankook panel		Rakuten panels		Pooled analysis	
	Perimenopausal (*n* = 568)	Postmenopausal (*n* = 368)	Perimenopausal (*n* = 181)	Postmenopausa (*n* = 285)	Perimenopausal (*n* = 233)	Postmenopausal (n = 167)	Perimenopausal (n = 982)	Postmenopausal (n = 820)
Ever received treatment for VMS	106 (18.7%)	57 (15.5%)	13 (7.2%)	22 (7.7%)	25 (10.7%)	14 (8.4%)	144 (14.7%)	93 (11.3%)
Currently on treatment for VMS	75 (13.2%)	36 (9.8%)	7 (3.9%)	11 (3.9%)	15 (6.4%)	8 (4.8%)	97 (9.9%)	55 (6.7%)
Discontinued treatment for VMS	31 (5.5%)	21 (5.7%)	6 (3.3%)	11 (3.9%)	10 (4.3%)	6 (3.6%)	47 (4.8%)	38 (4.6%)

HT, hormone therapy; OTC, over the counter; SSRIs/SNRIs, selective serotonin reuptake inhibitors/serotonin and norepinephrine reuptake inhibitors; VMS, vasomotor symptoms.
[a]Participants were allowed to select more than one response; therefore, totals may not sum to 100%.
[b]Estrogen and progestogen therapy, conjugated equine estrogens with bazedoxifene, tibolone.
[c]Women who were receiving HT for menopausal VMS.
[d]Women who discontinued HT, or decided not to receive HT for VMS despite being HT-eligible based on clinical advice.
[e]Women who reported bleeding from the genital tract without a determined cause, acute liver failure or active liver disease, deep vein thrombosis, uterine cancer, ovarian cancer, heart attack, stroke, angina, myocardial infarction, or other contraindications based on local clinical inputs, including endometriosis, porphyria cutanea tarda, dementia, coronary heart disease, migraine, personal or inherited high risk of thromboembolic disease, high triglycerides, confirmed or suspected hormone-sensitive malignancies/prior estrogen-sensitive breast cancer, and leiomyosarcoma.
[f]Women with both contraindication(s) and high-risk comorbidity were included in both the ``HT-ineligible due to contraindications'' subgroup and the ``HT-caution due to high risk comorbidity'' subgroup.
[g]Women who had received HT but discontinued due to various reasons.
[h]Women who were advised by a physician that they were HT-ineligible due to contraindications or HT-caution due to high risk comorbidity, but the specific condition(s) was not disclosed.
[i]Women who were smokers, had relatives with breast cancer, or had high cholesterol, high triglycerides, migraine, or diabetes.
[j]SSRIs/SNRIs, gabapentin, pregabalin, non-HT clonidine.
[k]Botanical, traditional Korean medicine, traditional Chinese medicine, herbal hormones, black cohosh, and red clover.
[l]Omega-3-fatty acids, vitamin E, estrogen receptor ingredients (Beksuo), pomegranate extract/concentrate, and pagoda tree fruit extract.
[m]Anxiety control, cognitive behavioral therapy, paced breathing, hypnosis, yoga, aromatherapy, and reflexology.
[n]Acupuncture, cupping, moxibustion, cooling face mask, massage, and homeopathy.

smokers, had relatives with breast cancer, or had high cholesterol, high triglycerides, migraine, or diabetes). Participants were also commonly found to be HT-averse despite being eligible (Table 5). Among the small subset of HT-stoppers (3.4%), safety was the most common reason for treatment discontinuation.

DISCUSSION

The present study used an online cross-sectional survey leveraging existing national panels in East Asia to understand the prevalence and severity of menopausal VMS, and key demographics and baseline characteristics among perimenopausal or postmenopausal women aged 40 to 65 years. Based on a sample representing national age and geographic distributions, the prevalence of menopausal VMS was estimated to be around 80%, with =55% having moderate-to-severe VMS. This is comparable with findings from the Pan-Asia menopause study, where hot flashes ranged from 45.7% to 72.2% and night sweats from 28.4% to 39.9% among symptomatic women.[15] Additionally, in a study in China, 83.4% reported hot flashes and 82.9% night sweats.[3] Other studies have reported lower prevalence rates (<60%), and were subject to notable limitations due to reporting mechanisms and the use of non-representative samples.[4,16-18] Although our study suggests notable cross-location heterogeneity, comparisons of menopausal VMS prevalence across regions should be made with caution.

The burden on quality of life, participants' eligibility, and willingness to receive menopausal HT, current treatment landscape, and participants' healthcare-seeking behavior and key driving factors were also evaluated based on selfreported data. Moderate-to-severe VMS significantly compromised participants' quality of life across all geographical locations. Although cross-location heterogeneity was observed, the menopausal symptom burden in this study was high and similar to other reports from these locations.[4,19,20] Interestingly, while existing evidence commonly focused on the HRQoL impairment among postmenopausal women, the present study suggested that a substantial burden of menopausal symptoms was also present in perimenopausal women; in some cases this burden was higher than in postmenopausal women. Based on the MENQOL scale, vasomotor, psychosocial, and physical symptoms were the most common complaints in the three locations, affecting >70% of participants, while sexual symptoms were less prevalent (>50% reported a burden in the sexual domain). The most bothersome symptoms were sweating, night sweats, feeling tired or worn out, poor memory, and hot flashes. Moderate-to- severe menopausal VMS also substantially impaired participants' perceptions of work productivity and daily activities. Productivity loss was seemingly highest in the Edelman panel, followed by the Hankook panel and the Rakuten panels, and the impact was highest among perimenopausal women compared with postmenopausal women, because overall the majority of perimenopausal women were in paid employment.

Regarding the current treatment landscape, undertreatment was a common issue, with over half of participants with moderate-to-severe VMS remaining untreated. More participants relied on non-prescription treatments vs. prescription treatments, and only around half of the participants in the Edelman panel had visited hospitals or clinics to seek care for VMS, with <25% in the Hankook panel and the Rakuten panels doing so. The significant burden of VMS in perimenopausal or postmenopausal women highlights the importance of effective symptom management, but the observed low treatment rate suggests that this important public health issue has not yet been well addressed.[21]

In addition, over 60% of participants who did not pursue prescription treatment were not aware of the long-term risks associated with VMS symptoms, and the majority were willing to seek prescription treatment if informed about the risks associated with remaining untreated. Our findings are consistent with previous studies in Asia, which also concluded that most postmenopausal women thought menopausal symptoms was a natural process and were unaware of the potential benefits of prescription treatment.[11,22] This is also the case in other parts of the world, for example in Italy,[23] the United Arab Emirates,[24] Jordan,[25] and Australia,[26] where studies have identified a lack of knowledge of the benefits of prescription treatment, such as preventing osteoporosis and ameliorating abdominal fat accumulation. Inadequate management presents a consistent issue based on existing evidence, not only in Asia[27-29] but also in Europe,[30] Lebanon,[31] and the United Arab Emirates[32] and our findings highlight the need to improve awareness and reduce the undertreatment rate in East Asia. Education of healthcare providers is, therefore, key.

Treatment options for moderate-to-severe menopausal VMS in current clinical practice are limited. Furthermore, a considerable proportion of study participants were ineligible for or cautioned against HT, or were HT-averse due to safety concerns. Consistent with our findings, previous studies found that of postmenopausal women in China, 38% had somewhat negative and 32% very negative perspectives regarding HT,[11] and in a study in Korea, only 31% had a positive perspective.[33] The lack of appropriate treatment options currently available is, perhaps, reflected by the strong willingness shown by participants to try novel non-HT treatments, even when assuming the absence of reimbursement.

The present study may be subject to certain limitations inherent to survey studies based on online panels. A typical concern in healthcare survey studies is that participants with health conditions might be more interested in completing the survey, leading to potential non-response bias. However, this study had a high completion rate, with only 2% of eligible participants not completing the survey. Also, as the study relied on self-reported data, the collected responses might be subject to reporting bias due to social desirability. For example, selfreported severity of menopausal VMS might not accurately reflect a participant's clinical representation. Additionally, some questions (eg, treatment information, HT eligibility) might require proficiency in basic medical knowledge. To improve data quality and validity, the present study used clearly defined criteria based on the US FDA guidelines and have clinical validity. Given the retrospective nature of the survey, the data accuracy may be compromised by response bias due to inaccurate memory recall. To improve data accuracy and minimize response bias, this study used validated HRQoL instruments with a short length of recall to collect information on participants' symptoms and the impact on their HRQoL in the past week/7 days. In addition, all questions were logically organized (eg, most common to least common, recent to past) to facilitate memory recall. Finally, the generalizability of this study may be limited due to selection bias, given that the members of the online panels might not be completely representative of the general population of women within the age range of interest for each location. For example, the panel members were typically from a higher socioeconomic status than the general population, as evidenced by higher education levels and household incomes. To minimize selection bias, stratified sampling was used to ensure that participants were comparable with the general population on key factors with implications on the risk of menopausal VMS and care-seeking behavior, including age and geographic region.

Taken together, the data generated by this study suggest that to improve long-term health outcomes and HRQoL among participants experiencing moderate-to-severe menopausal VMS, alternative non-HT treatments with promising safety and efficacy profiles are needed to address the critical treatment gap in current care.

CONCLUSIONS

Based on national surveys among perimenopausal or postmenopausal women aged 40 to 65 years, this study provides valuable evidence about the prevalence of menopausal VMS in East Asia. As a prevalent condition affecting around 80% of perimenopausal or postmenopausal women in East Asia, menopausal VMS is associated with a significant burden in both groups. The current management for moderate-to-severe menopausal VMS is suboptimal, as demonstrated by the high undertreatment rate, low awareness, limited treatment options, and concerns regarding available prescribed therapies. Novel non-HT treatment options with effective symptom management and minimal side effects for menopausal VMS are a significant need.

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Data sharing statement: Researchers may request access to anonymized participant-level data, trial-level data, and protocols from Astellas-sponsored clinical trials at www.clinicalstudydatarequest.com. For the Astellas criteria on data sharing see: https://clinicalstudydatarequest.com/Study-Sponsors/Study-Sponsors-Astellas.aspx.

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