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ORIGINAL RESEARCH

Prevalence and impact of vasomotor symptoms associated with menopause among Nordic women: Subgroup analysis from an international cross-sectional survey

Angelica Lindén Hirschberg[1] | Päivi Polo-Kantola[2] | Inger Øverlie[3] | Ellen Løkkegaard[4] | Elinor Cockburn[5] | Carol Rea[6] | Janet S. Kim[7]

[1]Department of Women's and Children's Health, Karolinska Institutet and Department of Gynecology and Reproductive Medicine, Karolinska University Hospital, Stockholm, Sweden

[2]Department of Obstetrics and Gynecology, Turku University Hospital and University of Turku, Turku, Finland

[3]Medicus Oslo AS, Oslo, Norway

[4]Department of Obstetrics and Gynecology, Copenhagen University Hospital, Hillerød, Denmark

[5]Medical Affairs Nordics, Astellas Pharma Global Development Inc., Northbrook, Illinois, USA

[6]Brand & Integrated Research Solutions, IQVIA, London, UK

[7]Astellas Pharma Global Development Inc., Northbrook, Illinois, USA

Correspondence
Angelica Lindén Hirschberg, Department of Women's and Children's Health, Karolinska Institutet, K6 Kvinnors och barns hälsa, K6 NOGRH Lindén Hirschberg, 171 77 Stockholm, Sweden.
Email: angelica.hirschberg.linden@ki.se

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Abstract

Introduction: The objectives of this study were to evaluate the prevalence and impact of moderate to severe vasomotor symptoms (VMS) on quality of life, sleep, work, and daily activities. We also assessed treatment patterns for VMS, lifestyle changes to mitigate VMS, and attitudes toward available treatments and menopause.

Material and Methods: Women from Denmark, Finland, Norway, and Sweden aged 40–65 years completed an online survey as part of a larger multinational study. The primary outcome, prevalence of moderate to severe VMS, was assessed in postmenopausal women. Secondary outcomes, including the impact of VMS on quality of life (Menopause-Specific Quality of Life [MENQoL] questionnaire), sleep (Patient-Reported Outcomes Measurement Information System [PROMIS] Sleep Disturbances-Short Form 8b), and work and daily activities (Work Productivity and Activity Impairment [WPAI] questionnaire) were assessed in perimenopausal and postmenopausal women experiencing ≥1 moderate to severe hot flush per day in the prior month. Additionally, survey questions evaluated treatment patterns, lifestyle changes, and opinions toward VMS treatment and menopause in perimenopausal and postmenopausal women.

Results: Among 6383 postmenopausal women (primary analysis population), 739 (11.6%) experienced moderate to severe VMS regardless of whether they were receiving treatment. Among 863 symptomatic perimenopausal and postmenopausal women (secondary analysis population), VMS impaired quality of life and sleep. Work and daily activities were impaired by 24.2% and 30.6%, respectively. Around 35% of women sought advice; however, most women (>60%) reported not taking any treatment for VMS. Among those treating VMS, supplements and nonprescription medications were the most common treatments (19.2%); 12.9% of women reported taking menopausal hormone therapy. As many as 54.3% of women reported taking

Abbreviations: MENQoL, Menopause-Specific Quality of Life questionnaire; MHT, menopausal hormone therapy; PROMIS SD SF-8b, Patient-Reported Outcomes Measurement Information System Sleep Disturbances–Short Form-8b; SD, standard deviation; VMS, vasomotor symptoms; WPAI, Work Productivity and Activity Impairment questionnaire.

over-the-counter treatments; 77.8% adopted lifestyle changes to mitigate VMS. One in 4 women (25.6%) expressed concerns about menopausal hormone therapy side effects; 49.5% of women who had used nonmenopausal hormone therapy prescription medication stopped for lack of efficacy. Many women strongly agreed that menopause is a natural part of aging.

Conclusions: Over 10% of postmenopausal Nordic women reported suffering from moderate to severe VMS. VMS impaired the quality of life, sleep, work productivity, and daily activities among perimenopausal and postmenopausal Nordic women, emphasizing the need for effective and well-tolerated treatments.

KEYWORDS
menopause, statistics, vasomotor symptoms, women's health issues

1 | INTRODUCTION

Climacteric vasomotor symptoms (VMS), which include hot flushes and night sweats associated with menopause, have a worldwide prevalence of nearly 60% among women aged 40–64 years.[1] Among European women, estimates of VMS prevalence range from 31% to 97% across countries and age groups and can vary depending on study definitions.[1–4] Although some data on VMS prevalence and impact are available for other countries in Europe, Nordic data are limited.

Many women report negative effects of VMS associated with menopause on quality of life and sleep, with more severe symptoms causing greater disturbances.[5–9] With increasing average life expectancies, women generally also have longer work careers, presenting a higher likelihood of working during climacteric.[10,11] Daytime VMS often reduce the ability to work.[5] Nighttime VMS interrupt sleep, affecting sleep duration and quality, which can impair cognitive function and result in burnout.[5] Thus, VMS can strongly impair daily activities and productivity at work,[5] emphasizing the need for adequate treatments.[12]

Menopausal hormone therapy (MHT) is commonly prescribed as a first-line treatment for moderate to severe VMS and historically has been considered the most effective treatment option for symptom relief.[13,14] However, many women have long-term safety concerns regarding MHT, which have led to a global decline in use.[2,3,15,16] Nonhormonal prescription drugs—such as selective serotonin reuptake inhibitors (SSRIs) and serotonin–norepinephrine reuptake inhibitors (SNRIs) for hot flushes or gabapentin for night sweats—are also recommended for women unable or unwilling to take MHT; however, these drugs are often insufficient in alleviating symptoms and can cause side effects such as nausea, dizziness, sexual dysfunction, and somnolence.[13,16] Moreover, these drugs are not generally approved for the treatment of VMS in Nordic countries. In addition to these nonhormonal options, a new option is fezolinetant, which is a nonhormonal, neurokinin 3 receptor antagonist treatment option for moderate to severe VMS. While not available at the time of the present survey, fezolinetant is now approved in many countries, including the United States, in Europe, and in Asia at a dose of 45 mg once daily.[17–22]

Key message

This international cross-sectional survey of women aged 40–65 years from Nordic Europe adds to global findings demonstrating that moderate to severe vasomotor symptoms are prevalent and impair quality of life, sleep, work productivity, and daily activities.

We recently showed that 16% of postmenopausal women aged 40–65 years from a multinational online survey experienced moderate-to-severe VMS. Combined data from women in Brazil, Canada, Mexico, and Nordic Europe were presented.[23] An additional analysis of data from perimenopausal and postmenopausal women from the same study indicated that VMS impacted quality of life, sleep, work, and daily activities. Yet, 57% of the women were not receiving pharmacologic treatment for VMS.[23] To build on previous findings, we report a subgroup analysis from that survey assessing the impact of moderate to severe VMS, as well as treatment patterns for VMS, lifestyle changes to mitigate VMS, attitudes toward menopause, and attitudes toward treatment among women from Nordic Europe overall and in individual Nordic countries.

2 | MATERIAL AND METHODS

2.1 | Study design

The Women with Vasomotor Symptoms Associated with Menopause (WARM) study was a cross-sectional online survey conducted between November 4, 2021, and January 17, 2022, in Brazil, Canada,

Mexico, and Nordic Europe. The survey was developed and carried out, and the data were analyzed by IQVIA (London, UK) and Astellas Pharma (Addlestone, UK). This subgroup analysis focuses on women from the four Nordic European countries included in the WARM study: Denmark, Finland, Norway, and Sweden.

An invitation to the survey was sent to potential respondents, who were informed that participation would take approximately 30 min with no set time limit for completion and that women could interrupt and then continue at any point. Dynata (Plano, TX, USA) managed the sample in terms of informing the women about the duration of the survey. The survey was translated into native languages in each country. Linguistic confirmation and pilot testing with revision ensured consistency across translation and correct interpretation of questions.

2.2 | Populations

Women aged 40–65 years were recruited from national panels managed by Dynata; they received directly emailed invitations to participate with the survey link.[23] Dynata uses websites, social media, and corporate brand loyalty lists for recruitment. Within each Nordic European country, the panel of participants was representative of the demographic and regional characteristics (Table 1).

Women were excluded if they had never menstruated or were menstruating regularly, were receiving breast cancer treatment, or reported use of antiestrogens, aromatase inhibitors, or gonadotropin-releasing hormone agonists or antagonists in the prior year.

Two groups were formed: (1) postmenopausal women (primary analysis population) and (2) perimenopausal or postmenopausal women experiencing moderate to severe VMS (secondary analysis population; Figure 1). Postmenopause was defined retrospectively as ≥12 consecutive months without a menstrual period; perimenopause was defined retrospectively as changes in menstrual periods or frequency of menstrual periods but <12 months without a period.

Of the 17 446 perimenopausal and postmenopausal women who accessed the survey, 16 583 (95.1%) were not included, most for not passing screening ($n = 12\,075$; 69.2%); 4119 (23.6%) women were excluded because they were premenopausal (i.e., they had no significant change in menstrual cycle frequency). Overall, 6383 women who responded to the screener and were postmenopausal met the inclusion criteria for the primary analysis population. A total of 863 women who responded to the screener and indicated they were experiencing moderate to severe VMS associated with menopause in the month prior to the survey (including ≥1 moderate to severe hot flush per day) and were postmenopausal or perimenopausal met the inclusion criteria for the secondary analysis population. Analysis populations are shown in Figure S1.

2.3 | Measurements

VMS severity was categorized according to US Food and Drug Administration definitions: mild, having the sensation of heat without sweating; moderate, having the sensation of heat with sweating but able to continue activities; and severe, having the sensation of heat with sweating and unable to continue activities.[24]

Two validated questionnaires were used to assess the impact of VMS on quality of life and work and daily activities among perimenopausal and postmenopausal women: the Menopause-Specific Quality of Life (MENQoL) questionnaire and the Work Productivity and Activity Impairment: Specific Health Problem (WPAI:SHP) questionnaire (Table S1). In the MENQoL questionnaire, an individual score was calculated for each of the four domains (physical, psychosocial, sexual, and vasomotor) and a composite score was determined that was the mean of the domain scores. Scores >3 indicated bother overall and in each domain.[25,26] In the WPAI questionnaire, work and daily activity impairment were reported on a scale from 0 (no impairment) to 10 (complete prevention) and then converted to a percentage scale (0% to 100%).[27]

A third standardized questionnaire, administered only in Denmark, evaluated the impact of VMS on sleep: the Patient-Reported Outcomes Measurement Information System (PROMIS) Sleep Disturbances (SD) Short Form (SF) 8b, where the total scores were summed across eight items on a scale of 1 to 5, giving a score from 8 to 40, with higher scores indicating greater sleep disturbance.

Other outcomes, including number and duration of daily VMS, healthcare resource utilization, nonmedical sources of advice about VMS, treatment patterns (including the proportion of women who were currently treating VMS with supplements and nonprescription treatments, prescription nonhormonal and hormonal medications [e.g., SSRI/SNRIs, MHT], alternative medications/naturopathy, and prescription bioidentical "natural" hormones), lifestyle changes made to mitigate VMS, attitudes toward treatment, and opinions on menopause were captured in the survey (Table S1).

2.4 | Study outcomes

The primary outcome—the overall prevalence of moderate or severe VMS associated with menopause—was evaluated in the primary analysis population. Methods for determining prevalence, reported previously,[23] used the number of postmenopausal women experiencing moderate-to-severe VMS as the numerator and all postmenopausal women who provided consent as the denominator. VMS prevalence was derived only from the primary analysis population.

Secondary outcomes—the impact of VMS on quality of life, sleep, work, and daily activities, treatment patterns, lifestyle changes to mitigate VMS, opinions about treatments, and opinions about menopause—were evaluated in the secondary analysis population.

2.5 | Data collection

Sample sizes were selected to provide approximately 5% to 7% precision for estimating the prevalence of moderate to severe VMS among postmenopausal women and were adjusted for feasibility

TABLE 1 Demographic characteristics and characteristics of vasomotor symptoms (VMS) among perimenopausal and postmenopausal women (secondary analysis population).

	Total Nordics (*N* = 863)	Denmark (*n* = 258)	Finland (*n* = 195)	Norway (*n* = 63)	Sweden (*n* = 347)
Menopausal stage, *n* (%)					
Perimenopause	124 (14.4)	34 (13.2)	32 (16.4)	17 (27.0)	41 (11.8)
Postmenopause	739 (85.6)	224 (86.8)	163 (83.6)	46 (73.0)	306 (88.2)
Age, *n* (%)					
40–44 years	24 (2.8)	8 (3.1)	6 (3.1)	5 (7.9)	5 (1.4)
45–50 years	145 (16.8)	44 (17.1)	39 (20.0)	12 (19.0)	50 (14.4)
51–55 years	308 (35.7)	77 (29.8)	83 (42.6)	27 (42.9)	121 (34.9)
56–60 years	261 (30.2)	90 (34.9)	48 (24.6)	12 (19.0)	111 (32.0)
61–65 years	125 (14.5)	39 (15.1)	19 (9.7)	7 (11.1)	60 (17.3)
Race/ethnicity, *n* (%)					
White	843 (97.7)	254 (98.4)	192 (98.5)	59 (93.7)	338 (97.4)
Hispanic/Latino	5 (0.6)	1 (0.4)	0	1 (1.6)	3 (0.9)
Asian	5 (0.6)	1 (0.4)	0	1 (1.6)	3 (0.9)
Mixed races/ethnic groups	5 (0.6)	2 (0.8)	1 (0.5)	0	2 (0.6)
Native American /Alaska Native	1 (0.1)	0	1 (0.5)	0	0
Other	1 (0.1)	0	0	0	1 (0.3)
Prefer not to say	3 (0.3)	0	1 (0.5)	2 (3.2)	0
BMI, *n* (%)					
<18.5 kg/m^2	10 (1.2)	2 (0.8)	1 (0.5)	2 (3.2)	5 (1.4)
18.5–24.9 kg/m^2	318 (36.8)	94 (36.4)	70 (35.9)	21 (33.3)	133 (38.3)
25–29.9 kg/m^2	374 (43.3)	113 (43.8)	88 (45.1)	26 (41.3)	147 (42.4)
30–39.9 kg/m^2	149 (17.3)	45 (17.4)	33 (16.9)	11 (17.5)	60 (17.3)
Prefer not to say	12 (1.4)	4 (1.6)	3 (1.5)	3 (4.8)	2 (0.6)
Smoking status, *n* (%)					
Yes	210 (24.3)	64 (24.8)	65 (33.3)	11 (17.5)	70 (20.2)
Quit <12 months ago	28 (3.2)	10 (3.9)	8 (4.1)	4 (6.3)	6 (1.7)
Quit >12 months ago	314 (36.4)	100 (38.8)	57 (29.2)	29 (46.0)	128 (36.9)
No	311 (36.0)	84 (32.6)	65 (33.3)	19 (30.2)	143 (41.2)
Regular alcohol consumption, *n* (%)					
Yes	315 (36.5)	90 (34.9)	64 (32.8)	20 (31.7)	141 (40.6)
No	541 (62.7)	167 (64.7)	130 (66.7)	42 (66.7)	202 (58.2)
Prefer not to say	7 (0.8)	1 (0.4)	1 (0.5)	1 (1.6)	4 (1.2)
VMS severity, *n* (%)					
Moderate	637 (73.8)	174 (67.4)	152 (77.9)	45 (71.4)	266 (76.7)
Severe	226 (26.2)	84 (32.6)	43 (22.1)	18 (28.6)	81 (23.3)
Proportion of women experiencing menopause-related symptoms[a] in the past month, *n* (%)					
1 symptom (hot flushes only)	22 (2.5)	9 (3.5)	6 (3.1)	2 (3.2)	5 (1.4)
2 symptoms (hot flushes and night sweats)	18 (2.1)	11 (4.3)	4 (2.1)	1 (1.6)	2 (0.6)
3 symptoms	137 (15.9)	52 (20.2)	26 (13.3)	5 (7.9)	54 (15.6)
4–6 symptoms	371 (43.0)	110 (42.6)	73 (37.4)	23 (36.5)	165 (47.6)
>6 symptoms	315 (36.5)	76 (29.5)	86 (44.1)	32 (50.8)	121 (34.9)

TABLE 1 (Continued)

	Total Nordics ($N=863$)	Denmark ($n=258$)	Finland ($n=195$)	Norway ($n=63$)	Sweden ($n=347$)
Frequency of hot flushes					
n	777	234	172	57	314
Mean (SD) times/day	4.86 (5.24)	4.73 (4.46)	4.68 (4.92)	3.46 (3.69)	5.32 (6.08)
Median (range) times/day	3 (1–60)	3 (1–40)	3.5 (1–45)	2 (1–24)	4 (1–60)
Frequency of night sweats					
n	655	193	148	50	264
Mean (SD) times/day	3.21 (3.45)	3.12 (3.63)	3.16 (4.22)	3.34 (3.77)	3.27 (2.71)
Median (range) times/day	2 (1–38)	2 (1–30)	2 (1–38)	2 (1–23)	3 (1–20)
Duration of hot flushes					
n	776	234	172	57	313
Mean (SD) min/day	27.06 (71.68)	21.79 (58.61)	28.77 (89.84)	45.40 (90.11)	26.70 (65.07)
Median (range) min/day	5 (1–900)	5 (1–480)	5 (1–900)	10 (1–490)	5 (1–480)
Duration of night sweats					
n	654	193	148	50	263
Mean (SD) min/day	41.50 (97.39)	37.36 (99.55)	50.28 (121.57)	81.12 (128.26)	32.08 (67.57)
Median (range) min/day	10 (1–960)	8 (1–960)	10 (1–900)	17.5 (1–490)	5 (1–420)

Abbreviation: BMI, body mass index.

[a]Women were specifically asked about the following menopausal symptoms: sleep disturbances, mood changes, weight gain, hot flushes, night sweats, chills, cognitive disturbances, urinary problems, joint pain, sexual dysfunction, and pain or discomfort during intercourse.

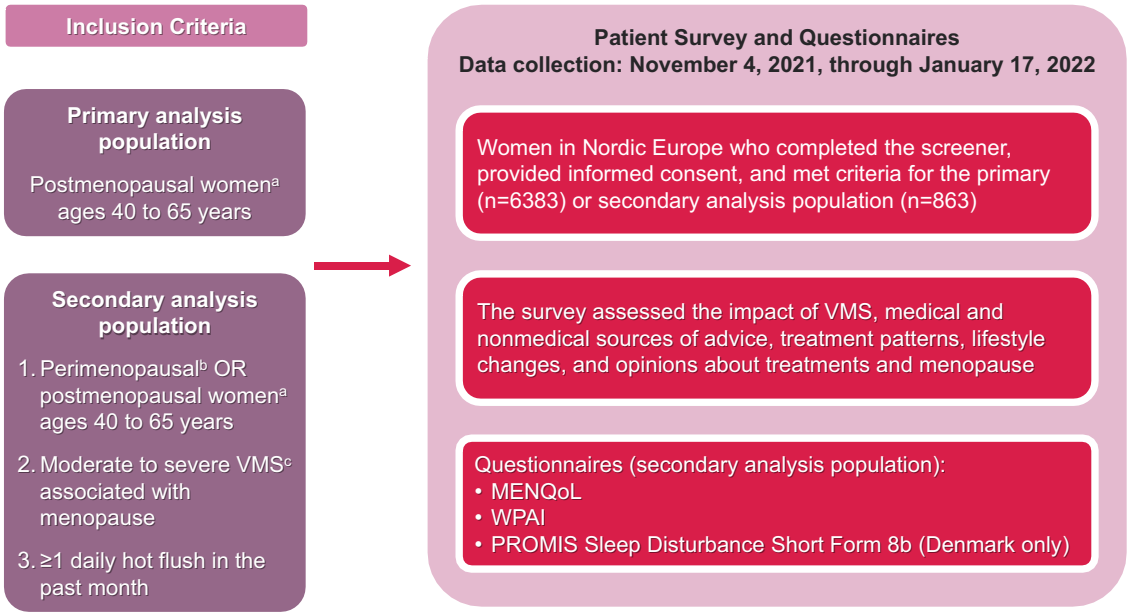


FIGURE 1 Study design. [a]Defined as not menstruating in ≥12 consecutive months. [b]Defined as having changes in menstrual periods or frequency of periods but <12 consecutive months without a period. [c]Moderate was defined as the sensation of heat with sweating, able to continue activity; severe was defined as the sensation of heat with sweating, causing cessation of activity. MENQoL, Menopause-Specific Quality of Life; PROMIS, Patient-Reported Outcomes Measurement Information System; VMS, vasomotor symptoms; WPAI, Work Productivity and Activity Impairment.

based on country-specific populations. In Denmark and Finland, the target samples were each 320, providing a 5.5% precision level per country. In Norway, the target sample was 180, providing a 7.3% precision level. Precision was calculated based on the most conservative assumption, with the largest possible variance around estimating the prevalence. In Sweden, the target sample was 400, which

provided a 4.9% precision level. The survey closed once a target sample was reached, including approximately 10% of perimenopausal women in each country.

All responses were captured using the online, web-based survey. Missing, incomplete, and inconsistent responses were screened using quality control checks. Women could skip some responses on the MENQoL, PROMIS, and WPAI questionnaires; for all other questions that were not a part of the MENQoL, PROMIS, or WPAI questionnaires, the survey was programmed not to proceed if replies were missing, which ensured that the survey was complete. Anonymity was maintained using deidentified numbers, which also prevented women from making multiple entries.

2.6 | Statistical analyses

Statistical methods were reported previously.[23] Analyses were conducted using the Statistical Package for the Social Sciences (SPSS; IBM SPSS Statistics; Chicago, IL, USA). There were no a priori hypotheses, and formal statistical tests were not conducted to evaluate intercountry differences because the study was designed with a main focus on descriptive understanding of data. Demographics and all primary and secondary outcomes were summarized descriptively. Data are reported as recorded with no imputation for missing data. The denominator for each item was based on the number of responses received for that item.

3 | RESULTS

3.1 | Prevalence of moderate to severe VMS among postmenopausal women

Of 6383 postmenopausal women included in the primary analysis of VMS prevalence (Figure 1), 739 (11.6%) reported experiencing moderate to severe VMS in the past month regardless of whether they were taking any treatment for VMS, including MHT (Figure S2). Demographic characteristics and characteristics of VMS among women in the primary analysis population are shown in Table S2.

3.2 | Characteristics of VMS among the secondary analysis population

Of the 863 women included in the secondary analysis population (Figure 1), 73.8% (75.8% perimenopausal, 73.5% postmenopausal) reported having moderate VMS and 26.2% (24.2% perimenopausal, 26.5% postmenopausal) reported having severe VMS; there was a numerically higher trend of women with severe VMS in Denmark (32.6%). Across the four Nordic countries, women experienced a mean of ≥3 hot flushes and ≥3 night sweats daily. There was a directional indication that women in Norway experienced fewer daily hot flushes but of longer duration than women in the other countries. Demographic characteristics and characteristics of VMS among women in the secondary analysis population are shown in Table 1.

3.3 | Impact of VMS on quality of life, sleep, work productivity, and daily activities among the secondary analysis population

Total MENQoL scores in all domains indicated that VMS were bothersome, with mean (SD) scores of 5.1 (1.7) in the vasomotor domain, 3.9 (1.6) in the physical domain, 3.4 (1.9) in the psychosocial domain, and 3.3 (2.2) in the sexual domain (Figure 2).

Among 258 women in Denmark, the mean (SD) PROMIS SD SF-8b score was 26.6 (6.7) on a scale from 8 to 40, indicating moderately disturbed sleep (see Figure S3 for individual PROMIS SD SF-8b items).

Daily activities were impaired by 30.6% and work productivity by 24.2%, mainly driven by an impact on presenteeism (23.7%; Figure 3). Women missed a mean (SD) of 3.4 (0.6) hours from work in the preceding 7 days (range in individual countries: 1.5 [0.3] in Finland to 4.7 [1.1] in Norway).

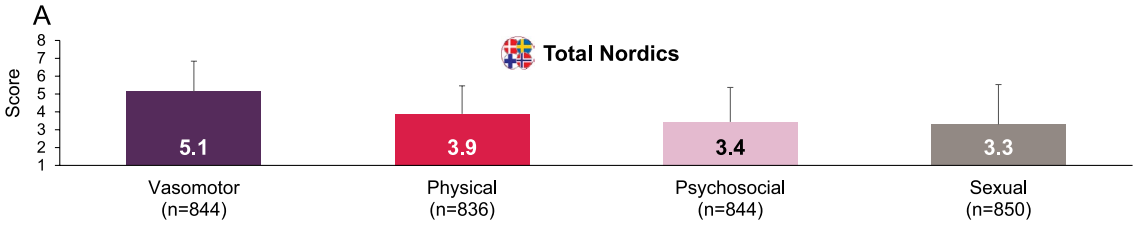
3.4 | Healthcare resource utilization among the secondary analysis population

In the total Nordic population sample (hereafter referred to as the total or overall Nordic population), 36.4% of women sought advice about VMS from any source and were currently receiving pharmaceutical treatment, whereas 35.8% sought advice but never received treatment, and 14.7% never sought advice from any source (Table 2). The most common reasons for not seeking advice from a healthcare provider were not wanting to take drugs to treat VMS (37.4% of women) and not wanting to be offered MHT (36.6%). To visit medical specialists for VMS was common; 43.0% of the women had ≥1 visit in the prior year (Table S3).

Overall, 36.3% of women consulted sources other than healthcare providers for advice about VMS. Common nonmedical sources of advice included the internet/websites (74.4%), family and friends (59.4%), and celebrities/influencers (31.3%; Table S4).

3.5 | Current and past treatment patterns among the secondary analysis population

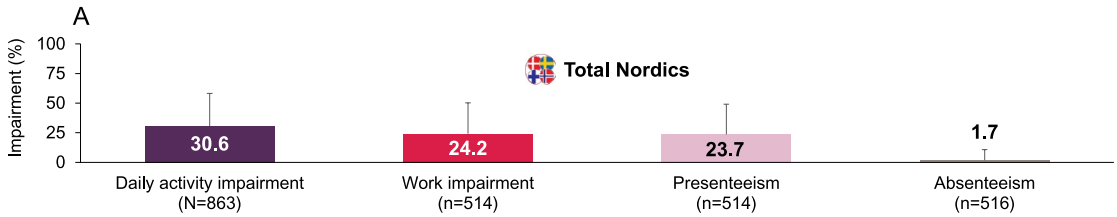
Despite experiencing moderate to severe symptoms, most women (>60% in the total Nordic population and in the individual countries) were not currently taking any treatment for VMS. Overall, 46.0% of women had never received MHT or non-MHT prescription medication for VMS. The percentage of women who had never received MHT was high in the total Nordic population (73.7%) and in the individual countries (Table 2). Among those who were treating VMS, common treatments included supplements and drugs without



B

MENQoL score, mean (SD)	Denmark	Finland	Norway	Sweden
Vasomotor	5.1 (1.6) (n=249)	5.1 (1.7) (n=191)	5.2 (1.6) (n=62)	5.2 (1.8) (n=342)
Physical	3.9 (1.6) (n=250)	3.8 (1.6) (n=188)	4.1 (1.5) (n=58)	4.0 (1.6) (n=340)
Psychosocial	3.2 (1.9) (n=252)	3.6 (1.8) (n=191)	3.9 (1.9) (n=60)	3.4 (2.0) (n=341)
Sexual	3.0 (2.2) (n=256)	2.9 (2.0) (n=193)	4.5 (2.1) (n=59)	3.5 (2.3) (n=342)

FIGURE 2 Impact of vasomotor symptoms on health-related quality of life. Mean (SD) MENQoL scores in the total Nordic population (A) and Denmark, Finland, Norway, and Sweden (B). Data are from perimenopausal and postmenopausal women experiencing moderate to severe VMS (secondary analysis population). MENQoL, Menopause-Specific Quality of Life questionnaire. Scores >3 indicate "bother."



B

WPAI score, mean % (SD)	Denmark	Finland	Norway	Sweden
Daily activity impairment	27.0 (25.8) (n=258)	32.8 (27.1) (n=195)	38.4 (25.6) (n=63)	30.7 (29.3) (n=347)
Work impairment	22.0 (26.0) (n=165)	24.5 (26.3) (n=101)	32.1 (23.1) (n=37)	24.5 (26.3) (n=211)
Presenteeism	21.2 (24.8) (n=165)	24.1 (26.0) (n=101)	31.4 (21.9) (n=37)	24.1 (25.9) (n=211)
Absenteeism	2.9 (13.5) (n=167)	0.9 (4.0) (n=101)	2.0 (8.1) (n=37)	1.0 (5.9) (n=211)

FIGURE 3 Impact of vasomotor symptoms on work productivity and daily activities. Mean (SD) Work Productivity and Activity Impairment questionnaire scores in the total Nordic population (A), and Denmark, Finland, Norway, and Sweden (B). Daily activity impairment data are from perimenopausal and postmenopausal women experiencing moderate to severe VMS (secondary analysis population). Work impairment, presenteeism, and absenteeism data were obtained from women who were employed and eligible to respond to work-related questions. Presenteeism is the percentage of impairment/ineffectiveness at work. Absenteeism is the percentage of missed work due to VMS. VMS, vasomotor symptoms; WPAI, Work Productivity and Activity Impairment questionnaire.

prescription (19.2%) and MHT (12.9%; Figure 4). Overall, 13.7% of perimenopausal and 12.7% of postmenopausal women reported use of MHT. Among perimenopausal and postmenopausal women who were experiencing moderate to severe VMS (secondary analysis population), 13.0% had previously taken but since discontinued use of MHT (Table 2).

In line with the low proportion of women taking MHT for VMS, mean (SD) openness to taking MHT for VMS was low at 2.6 (1.4) in the overall population (range: 2.1 [1.2] in Denmark to 3.1 [1.3] in Finland) on a scale from 1 (strongly do not consider) to 5 (strongly consider).

Over-the-counter treatments were especially common in Denmark, where 54.3% of women reported ever taking them for VMS; the most common was red clover (33.3% of women). In Finland, 19.5% of women reported using over-the-counter treatments for VMS, most commonly sage (10.3% of women). In Norway,

TABLE 2 Proportion of women seeking and receiving treatment for vasomotor symptoms (VMS) (secondary analysis population).

	Total Nordics (*N* = 863)	Denmark (*n* = 258)	Finland (*n* = 195)	Norway (*n* = 63)	Sweden (*n* = 347)
Sought advice for VMS, *n* (%)					
Sought advice and were currently receiving pharmaceutical treatment for VMS	314 (36.4)	92 (35.7)	75 (38.5)	24 (38.1)	123 (35.4)
Currently receiving prescription MHT[a]	111 (12.9)	25 (9.7)	26 (13.3)	10 (15.9)	50 (14.4)
Sought advice but never received pharmaceutical treatment for VMS	309 (35.8)	74 (28.7)	85 (43.6)	28 (44.4)	122 (35.2)
Never sought advice for VMS, *n* (%)	127 (14.7)	54 (20.9)	9 (4.6)	6 (9.5)	58 (16.7)
Never received MHT or non-MHT prescription medication for VMS regardless of seeking advice, *n* (%)	397 (46.0)	107 (41.5)	92 (47.2)	32 (50.8)	166 (47.8)
Never received MHT for VMS, *n* (%)	636 (73.7)	202 (78.3)	143 (73.3)	45 (71.4)	246 (70.9)
Had previously taken MHT for VMS but had since discontinued, *n* (%)	112 (13.0)	28 (10.9)	26 (13.3)	8 (12.7)	50 (14.4)

Abbreviation: MHT, menopausal hormone therapy.

[a]Includes MHT (e.g., estrogen therapy, progestin therapy).

27.0% of women reported using over-the-counter treatments for VMS, most often fermented soy and vitamin B_6 (15.9% of women). In Sweden, 33.1% of women reported using over-the-counter treatments for VMS, most commonly black cohosh (17.9% of women) (Table S5). In the total Nordic population, 46.8% of women who took over-the-counter treatments reported no change in VMS, and 33.5% reported a slight improvement; findings were generally consistent in the individual countries.

3.6 | Adoption of lifestyle changes to mitigate VMS in the secondary analysis population

In the total Nordic population and in the individual countries, women commonly adopted lifestyle changes to mitigate VMS (77.8% overall), and those who adopted lifestyle changes commonly reported no change or a slight improvement in VMS (Table S6).

3.7 | Attitudes toward available treatments and VMS in the secondary analysis population

Among women who took MHT for VMS, 30.4% strongly agreed that MHT improved their quality of life (Table S7). There was a numerical trend where women generally reported higher agreement with positive statements about MHT, such as "menopause-associated symptoms have significantly improved," and neutral statements about MHT, such as "treatment has improved my symptoms, but I worry about the long-term risks," compared with negative statements about MHT, such as "treatment has caused side effects" (Table S7).

Among women who never took MHT for VMS, the most common reasons were concern about side effects (25.6%), perception that menopause will pass naturally (25.2%), and concern about long-term risks (22.5%; Table S8). The most common reason for stopping MHT was concern over long-term risks, including breast cancer and cardiovascular health (33.0%; Table S8).

Women generally expressed moderate agreement with positive, neutral, and negative statements about non-MHT prescription medication, without much variation in the types of statements (Table S7). The most common reason women stopped taking non-MHT prescription medication was a lack of efficacy (49.5%; Table S8).

In the overall Nordic population, most women strongly agreed that menopause is a natural and inevitable part of the aging process (54.6%). Attitudes toward menopause were generally consistent across countries (Figure S4).

4 | DISCUSSION

This subgroup analysis of the cross-sectional online WARM survey provides novel insights into VMS prevalence and impact among women aged 40–65 years from four countries in Nordic Europe: Denmark, Finland, Norway, and Sweden. The prevalence of moderate to severe VMS among postmenopausal women was

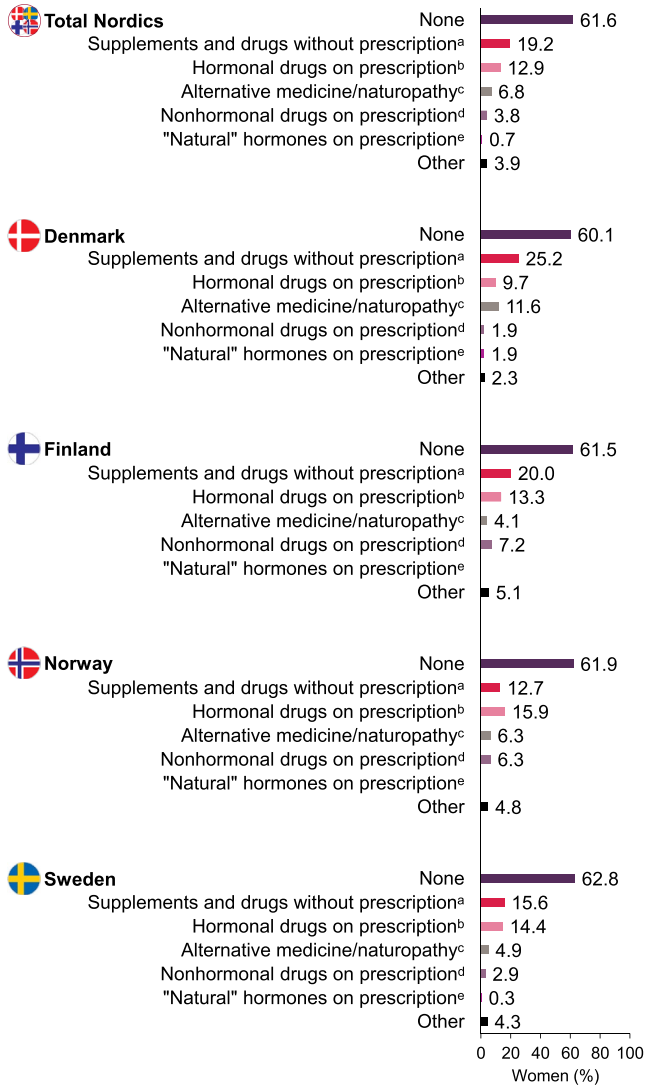


FIGURE 4 Current treatments in women with moderate to severe vasomotor symptoms. Data are from perimenopausal and postmenopausal women experiencing moderate to severe VMS (secondary analysis population). [a]Includes vitamins, calcium, and soy. [b]Includes MHT (e.g., estrogen therapy, progestin therapy). [c]Includes herbs, Kampo, Chinese medicine, acupuncture, acupressure, and aromatherapy. [d]Includes SSRIs, SNRIs, and antidepressants for hot flushes, and gabapentin for night sweats. [e]Compounded bioidentical "natural" hormones on prescription. MHT, menopausal hormone therapy; SNRI, serotonin–norepinephrine reuptake inhibitor; SSRI, selective serotonin reuptake inhibitor; VMS, vasomotor symptoms.

approximately 12% overall, with some variability across the countries. Of symptomatic perimenopausal and postmenopausal women, >70% reported having moderate VMS and >25% reported having severe VMS. In this large sample of symptomatic perimenopausal and postmenopausal women, VMS impaired quality of life, sleep, work productivity, and daily activities. Despite a range of available treatments, including MHT, many women were not treating VMS, often due to safety concerns with MHT. These results highlight the importance of, and need for, further treatment options to mitigate VMS, while underscoring the need for healthcare providers to offer education on the risks and benefits of these options.

The prevalence rates described here are generally lower than those reported in previous surveys, mainly from other parts of Europe. However, because of differences in study designs, cross-trial comparisons should be interpreted with caution. In another cross-sectional online survey in France, Germany, Italy, Spain, and the United Kingdom, Nappi et al. reported an estimated prevalence of moderate to severe VMS of 30%–50% among 2035 postmenopausal women aged 40–65 years. This prevalence was despite the fact that around 20% of the surveyed women were currently taking supplements and drugs without prescription and up to 10% were taking MHT.[3] A population-based study of premenopausal, perimenopausal, and postmenopausal women in Finland by Moilanen et al. revealed a prevalence of bothersome hot flushes of 3%–11% among 1184 women aged 45–64 years.[28] Using a Swedish online survey of 497 postmenopausal women aged 47–56 years, Lindh-Åstrand et al. found that 68% of women experienced hot flushes, with 36% experiencing them daily; around 5% of women in that study were currently using MHT, though alternative treatments were more common (22%).[29] Our relatively lower VMS prevalence may be due to methodological differences. For example, responses in Moilanen et al. were captured over an approximately 10-month interval compared with a 2.5-month interval in our study[28]; the lower prevalence rate in our study may be partially attributable to the comparatively shorter window of data collection, which, importantly, occurred during the winter. Prevalence rates from Moilanen et al. were based on an extensive home interview, self-administered questionnaires, and a physician-conducted exam, compared with an online survey here, which may have contributed to differences in prevalence.[28] As for the study by Lindh-Åstrand et al., the maximum age for eligibility was lower than the maximum age of women included in our study.[29] Thus, it is possible that VMS were less prevalent among our postmenopausal women because we enrolled women with a wide age range, as well as those outside the prevalence peak of VMS in early postmenopause.[30] Consistent with other reports, our findings confirmed that many women experience VMS despite the use of MHT or alternative treatments.

Consistent with prior findings, our study indicated that VMS substantially impaired quality of life.[3,31] One cross-sectional survey by Kingsberg et al. showed that mean MENQoL scores were higher when women had concomitant sleep and mood symptoms along with VMS, suggesting an additive impact of sleep and mood symptoms on decreased quality of life.[31] While women from the Kingsberg et al. study had higher MENQoL scores if they had sleep and mood symptoms with VMS, the mean MENQoL scores reported in our study were nevertheless generally higher, suggesting that the women were experiencing a substantial impact of VMS on quality of life.[31]

Our findings that VMS impaired work productivity and had a greater impact on daily activities were consistent with prior reports among women in other European countries.[3] With women

comprising nearly half of the workforce, impairment on work productivity caused by VMS is gaining widespread recognition.[10] This is especially relevant for women who extend their careers and work throughout and beyond menopause.[11] Additionally, other studies confirm that VMS impairs sleep.[4–6] Compromised work productivity, social functioning, and sleep may translate to far-reaching personal and economic implications,[32] highlighting the need for effective VMS mitigation.

Our results showing that >70% of women had never taken MHT for VMS were generally comparable to those describing women of similar ages in other European countries,[3] although fewer women in our study reported current use of MHT.[4] Current prescribing guidelines in Denmark, Finland, Norway, and Sweden recommend initiating MHT shortly after menopause and before the age of 60 years if indicated. Additionally, prescribing guidelines in Denmark suggest MHT use only after ≥3 months of lifestyle changes fail to mitigate VMS. Interestingly, women in Denmark had a numerically higher rate of severe VMS and a lower rate of MHT use. Despite the inclusion of MHT use in current prescribing guidelines, our study and others showed that many women did not treat VMS with MHT, possibly because they were worried about long-term risks, instead opting for other treatment approaches. There may be other options for women who are seeking alternatives to MHT (e.g., supplements, alternative medicines, over-the-counter treatments). However, notably, safety and efficacy data for most of these options are insufficient or even missing.[14,32]

Women in our study reported using alternative medicine/naturopathy and over-the-counter treatments, perhaps owing to regional guidelines or concerns about MHT. We found that >70% of women adopted lifestyle changes such as keeping cool, resting and relaxing, exercising, and wearing loose clothing to mitigate VMS, which was comparable to women in other European countries.[3] Notably, lifestyle changes for VMS mitigation are mentioned in prescribing guidelines in all countries included here.

Nearly half of women in our study had visited a medical specialist for VMS in the prior year, and many of them were not receiving treatment in spite of the fact that VMS were moderate to severe. A decent proportion had never sought advice for VMS, often because they did not want to be offered drugs or take MHT. Similarly, approximately 30%–60% of women in the Nappi et al. study reported visiting a healthcare provider for VMS in the prior 12 months, suggesting that many chose not to.[3] These treatment patterns may reflect women's perception that symptoms would resolve on their own. We confirmed previous reports that women considered menopause to be a natural and inevitable part of the aging process,[3] which could explain why women were going untreated and living with bothersome symptoms.

Limitations of this cross-sectional survey include strict inclusion criteria and a potential lack of generalizability. No measurements to define the time of menopause were used, but women were classified as perimenopausal or postmenopausal according to their self-reported time of last menstrual period. Using menstrual period frequency and recency to define menopausal stage does not account for women who may have been included while experiencing changes in menstruation because of other reasons, such as surgery, levonorgestrel-releasing devices, medications that prevent menstruation, or medical conditions leading to amenorrhea. Inclusion was limited to women who were literate and had internet access. Additionally, there is a potential for recall bias in any self-reported data. Last, because the data from this study were purely descriptive, the level and magnitude of VMS impact on quality of life, sleep, work productivity, and daily activities could not be addressed. However, the findings from this study can serve as a basis for future studies with a different focus on multivariable analyses that aim to quantify the impact of VMS on each respective outcome.

5 | CONCLUSION

This survey demonstrated that moderate-to-severe VMS occurred in approximately 12% of postmenopausal women aged 40–65 years from Nordic Europe, with some variation across individual Nordic European countries. Among symptomatic perimenopausal and postmenopausal women, the majority reported having at least moderate VMS, and over one-quarter reported having severe VMS. VMS markedly impaired quality of life, sleep, work productivity, and daily activities. However, despite these consequences, most women were not treating VMS or had adopted lifestyle changes to mitigate VMS. This might be because of possible safety concerns with MHT and apprehensions about a lack of efficacy with non-MHT prescription medications. The reasons for not treating VMS are likely complex; nevertheless, our findings indicate that a prevailing fear around the safety of MHT is a factor, particularly in a setting where there was a lack of approved, nonhormonal alternatives for the treatment of VMS.

AUTHOR CONTRIBUTIONS

Elinor Cockburn: conceptualization, funding acquisition, project administration, supervision. Carol Rea: Investigation, software. Janet S. Kim: Conceptualization, data curation, formal analysis, investigation, methodology, resources, validation. All authors: Visualization, Writing–Original draft, Review and editing.

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The authors gratefully acknowledge the women who participated in the survey, and Lora Todorova, MPH, MBA, for their contributions to the study. Inclusive language: Although this report uses gender-specific language to align with the inclusion criteria used in our survey and for consistency with publications referenced herein, we acknowledge that not all individuals who experience vasomotor symptoms associated with menopause have the same gender identity or use pronouns that are presented here.

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CONFLICT OF INTEREST STATEMENT

The authors declare the following financial interests/personal relationships which may be considered potential competing interests: A. Lindén Hirschberg reports serving on an advisory board and/or as a speaker for Astellas, Bayer, Besins Healthcare Ireland Ltd., and Gedeon Richter and receiving an unrestricted research grant from Avia Pharma AB and Besins Healthcare Ireland Ltd. P. Polo-Kantola reports lectures for Astellas, Bayer, CampusPharma, Exeltis, Gedeon Richter, and Novo Nordisk. I. Øverlie reports no conflicts of interest. E. Løkkegaard reports serving as a speaker at a meeting arranged by Pfizer, conducting a study for Radiometer, attending meetings arranged by Merck and Gedeon Richter, and attending an Astellas board meeting. E. Cockburn reports employment at Astellas. C. Rea is an employee of IQVIA, which was commissioned to run this study for Astellas on a fee-paid basis. J.S. Kim reports employment at Astellas.

DATA AVAILABILITY STATEMENT

Details for how researchers may request access to anonymized participant level data, trial level data, and protocols from Astellas sponsored clinical trials can be found at https://www.clinicaltrials.astellas.com/transparency/.

ETHICS STATEMENT

All study materials were approved by the independent Advarra institutional review board (Aurora, Ontario, Canada) on October 25, 2021, before data collection. Informed consent was given by checking a box before beginning the survey and as a condition of accessing the survey. Women were informed that their participation and responses would be anonymous and confidential without the use of any personally identifiable information. Participation was voluntary; women could withdraw from the survey at any time. The sponsor was revealed at the end of the survey.

ORCID

Angelica Lindén Hirschberg https://orcid.org/0000-0001-6481-6277

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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