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GYNAECOLOGY

Climacteric symptoms among full-time working HRT never-users in different work environments: a cross-sectional study

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ABSTRACT

Background: Climacteric symptoms affect a large and growing proportion of women worldwide. Furthermore, women are increasingly participating in the workforce. Many women do not use treatment for their symptoms; however, little is known about how untreated women experience climacteric symptoms. This study examined the occurrence and severity of climacteric symptoms among full-time working women before treatment and compared their experiences across two different work environments.

Methods: A cross-sectional study was conducted in a group of Finnish women aged 52–66 years who had never used any treatment for their climacteric symptoms and were employed full-time. The data were obtained from two population-based postal surveys. Statistical techniques were used to analyse the data.

Results: The most common symptoms among all participants ($n=338$) were hot flushes (80%), sweats (72%), and sleeping problems (72%). The most severe symptoms were hot flushes, sweats, and loss of sexual desire; 12% of participants experienced each of these as severe. Regarding symptom categories, vasomotor symptoms and loss of sexual desire were the most common and the most severe. Participants in either low-strain or high-strain jobs ($n=164$) most often experienced five (15%) or 10 (13%) different symptoms out of 12 presented in the study questionnaire. Participants in high-strain jobs ($n=79$) experienced a higher number of symptoms ($p=0.019$) and more often urinary incontinence ($p=0.008$) and depressive symptoms ($p=0.043$) than those in low-strain jobs ($n=85$). Furthermore, they experienced more severe sweats ($p=0.038$).

Conclusions: Hot flushes, sweats, sleeping problems, and loss of sexual desire were both common and severe among full-time working untreated women. In addition, symptoms were more troublesome among women in high-strain than low-strain jobs. Therefore, healthcare professionals should pay special attention to the above symptoms and to women in high-strain jobs.

PLAIN LANGUAGE SUMMARY

Menopausal symptoms affect millions of women worldwide, and this number continues to grow as the population ages. At the same time, more women than ever before are in employment. While many women do not use medical treatment for their symptoms, we know little about their specific experiences. In this study, we looked at how menopausal symptoms affect Finnish women aged 52–66 who work full-time and had never used any treatment. We also wanted to see if the type of work environment made a difference. The women took part in a large national survey where they were asked about 12 common symptoms. They rated how often they experienced these symptoms and how severe they felt. We then analysed their answers to find patterns. The results showed that many women suffered from bothersome symptoms, most commonly hot flushes, night sweats, sleeping problems, and a lower sex drive. We also found that women in high-stress or demanding jobs experienced more symptoms than those in less demanding roles. In conclusion, our study suggests that healthcare professionals should pay closer attention to these common symptoms. It is also vital to provide better support for women working in high-pressure environments to help them manage this stage of life.

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Introduction

Natural menopause is defined as 12 months of amenorrhoea without any obvious pathological or physiological cause (WHO Scientific Group 1996); the average age is 51 years (Luoto *et al.* 1994, Gold 2011). The period before and after menopause is often accompanied by symptoms known as menopausal or climacteric symptoms. The most common symptoms include sweats, typically night sweats, hot flushes, and sleeping problems (Dennerstein *et al.* 2000, Jokinen *et al.* 2003). While sweats on average last 2–7 years, 20–30% of women experience them 10–20 years after the menopause (Col *et al.* 2009, Lipasti *et al.* 2023). Hot flushes occur in 70–80% of menopausal women, with approximately 20% experiencing them as severe (Oldenhave *et al.* 1993, Jokinen *et al.* 2003). Sleeping problems typically relate to night sweats (Polo-Kantola *et al.* 2014). Urogenital symptoms, such as vaginal dryness and tenderness, are also common during this period of life (Oskay *et al.* 2005), as are loss of sexual desire and depressive symptoms (Lipasti *et al.* 2021, 2023). Symptom number varies (Hashimoto *et al.* 2020, Huang *et al.* 2023), generally peaking during the first few years after the menopause (McKinlay 1996, Col *et al.* 2009). Climacteric symptoms can negatively affect physical, psychological, and social well-being (Katainen *et al.* 2015, Hutchings *et al.* 2023). Hot flushes may impair daily activities, leading to embarrassing situations at work or in social interactions (Woods and Mitchell 2011), while poor sleep causes daytime fatigue and sleepiness, reducing concentration and work performance (Polo-Kantola *et al.* 2014, Woods *et al.* 2025).

Work is a universal human right (United Nations 1948) that serves economic, psychological, and social purposes, such as social status, identity, and self-esteem (McMahon 2017). In Finland, there are approximately 700,000 women aged 50–69 (Statistics Finland 2024a). The female employment rate is approximately 77%, and a similar proportion of all women work full-time (Statistics Finland 2024b). Furthermore, the statutory retirement age ranges from 63.5 to 70 years, depending on the year of birth (Finnish Centre for Pensions 2025). Climacteric symptoms often affect women's working lives: approximately 40% of women report impaired work ability (Bariola *et al.* 2017, D'Angelo *et al.* 2022), and some women even leave their jobs because of these symptoms (Griffiths *et al.* 2013).

As a significant workforce resource, women should be able to work to their full potential throughout their careers. As female workforce participation increases (Ortiz-Ospina *et al.* 2024), a growing number of women are experiencing climacteric symptoms while in employment. Open discussion about these symptoms at work is essential; women's experiences should not be ignored (Rees *et al.* 2021, Harper *et al.* 2022). Furthermore, some women cannot, or prefer not to, use treatments. Despite extensive research on climacteric symptoms, including studies exclusively on women receiving hormone replacement therapy (HRT) (Sussman *et al.* 2015), little is known about the experiences of untreated women in full-time employment.

Building on our previous study (Lipasti *et al.* 2025) among untreated full-time working women aged 52–56, the objective of this descriptive, retrospective cross-sectional study was to examine the experience of climacteric symptoms in an extended age group of 52–66-year-olds. This broader age range was chosen because symptoms may continue beyond the age of 60, at which stage many women remain in the workforce. The study examined the occurrence, severity, type, and number of symptoms, overall and by comparing women from two different types of work environments.

Methods

Participants and data collection

The Health and Social Support Study (HeSSup Study) is a randomised follow-up study of the Finnish working-age population and examines the impact of mental, physical, and social factors on health. The study was launched in 1998 with the following age cohorts: 20–24 years ($n = 16{,}190$), 30–34 years ($n = 16{,}250$), 40–44 years ($n = 16{,}277$), and 50–54 years ($n = 16{,}080$), and the survey was subsequently repeated in 2003 and 2012. For the present study, data on sociodemographic characteristics, working hours, and the psychosocial work environment were obtained from the HeSSup Study.

The Quality of Life among Middle-aged Women Study (QoL Study) is a sub-study of the HeSSup Study. The study was launched in 2000 and examines the well-being of women in midlife, including the

experience of climacteric symptoms. All women from the two oldest HeSSup Study cohorts who had responded to the HeSSup survey in 1998 were invited to participate in the QoL Study; at its inception in 2000, these women were aged 42–46 and 52–56 years. The QoL survey was repeated in 2005 and 2010 among the same women. The present study is based on the 2010 data, when the women were aged 52–56 and 62–66.

For both the HeSSup and the QoL studies, the data were gathered using postal questionnaires. A reminder letter was mailed to those who did not return their initial study questionnaires.

A total of 2,740 women in the 52–56-year-old cohort and 2,674 in the 62–66-year-old cohort participated, yielding response rates of 72.6% and 71.6%, respectively. For the pooled group of women aged 52–66, formed for the present study, the corresponding values were 5,414 and 72.1% (Figure 1).

Only women who were in full-time work and had never used any treatment for their climacteric symptoms were included ($n = 338$), whereas the remaining women (e.g. treatment users, part-time workers, pensioners) were excluded (Figure 1). Part-time workers and pensioners were excluded to ensure a more homogeneous sample reflecting the predominant Finnish employment pattern, where the majority of women work full-time, allowing for a more robust analysis.

Measures

The QoL questionnaire to assess the experience of climacteric symptoms was adapted and modified from the widely cited studies by Stadberg *et al.* (1997) and Kupperman *et al.* (1953). In the questionnaire, a numerical rating scale (NRS) ranged from 1 to 10, with 1 indicating 'Not at all' and 10 indicating 'Extremely disturbing'. Participants were asked to rate the severity of each symptom as experienced before receiving any treatment for them. All women received identical questionnaires regardless of whether they had received treatment for their symptoms or not. Employing the QoL questionnaire maintained methodological continuity with our previous studies (Lipasti *et al.* 2021, 2023, 2025). The English-language version of the questionnaire used in the present study is available as a supplementary file (Supplementary Appendix 1).

The experience of the work environment was assessed using the Job Demand-Control (JDC) model, one of the best-known models about workload, first presented by Karasek and later developed and tested by Karasek and Theorell (Karasek and Theorell 1990). The JDC questionnaire focuses on two factors related to psychosocial work experience: (1) Job demands, i.e. the physical and mental load of the

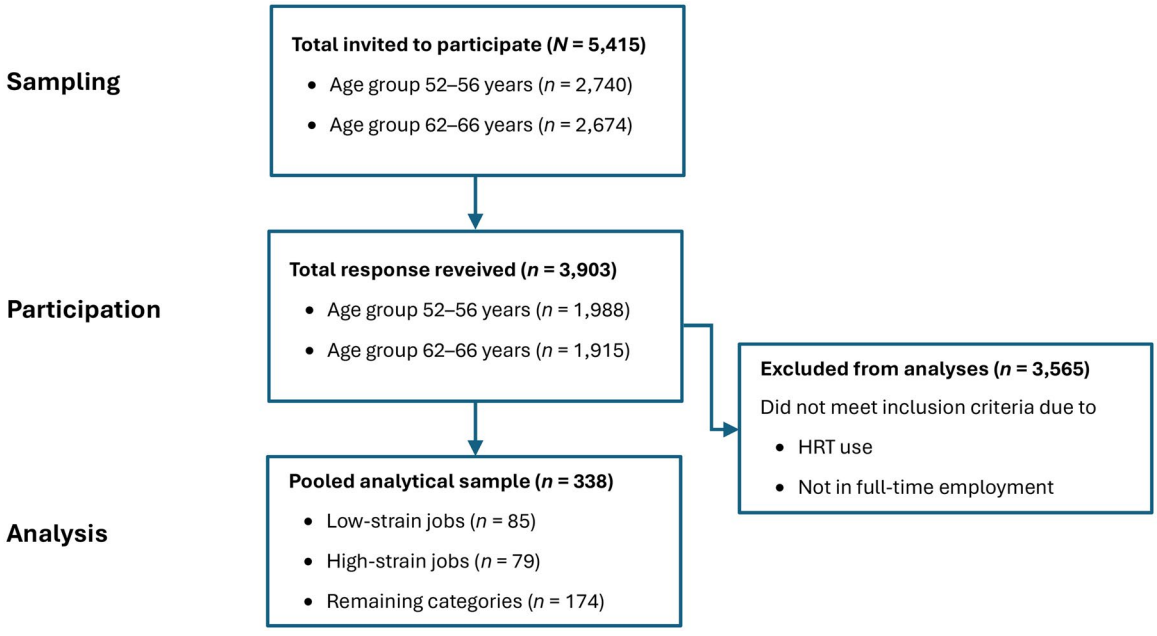

Figure 1. Study flow diagram.

work, and (2) Job control or decision latitude, i.e. the combination of workers' skill discretion and decision authority. The questionnaire comprises 19 items related to job demands, skill use, and task control. According to the JDC model, four types of psychosocial work experience were used: (1) High-strain jobs (i.e. high job demands combined with low job control), (2) Active jobs (i.e. high job demands combined with high job control), (3) Low-strain jobs (i.e. low job demands combined with high job control), and (4) Passive jobs (i.e. low job demands combined with low job control). In the present study, we focused on participants in high-strain and low-strain jobs due to the specific characteristics of the work environments in question: high-strain jobs, as a common source of job-related stress have been found to be the most harmful to psychosocial well-being, and low-strain jobs, in turn, have been found to be the least harmful (Karasek and Theorell 1990). The English-language version of the questionnaire used in the present study is available as a supplementary file (Supplementary Appendix 2).

The participants were classified into four groups according to their menopausal status: (1) Premenopausal, when the participants still had natural and regular menstruation, (2) Perimenopausal, when menstruation was irregular, (3) Postmenopausal, when menstruation had ceased spontaneously more than one year previously or after hysterectomy and bilateral salpingo-oophorectomy, and (4) Not classified, when participants' menopausal status was uncertain.

The outcome was the experience of climacteric symptoms, assessed by the occurrence, severity, type, and number of symptoms, before any treatment specifically for these symptoms was received.

To analyse, summarise, and report the results, we combined the 12 symptoms presented in the QoL questionnaire into five categories based on their types: (1) Vasomotor symptoms, which included hot flushes, sleeping problems, and sweats (2) Urogenital symptoms, which included dyspareunia, recurrent urinary tract infections, and urinary incontinence, (3) Affective symptoms, which included depressive symptoms, and nervousness, (4) Somatic symptoms, which included dizziness, and palpitations, and (5) Loss of sexual desire, which formed a category of its own. For statistical purposes, the symptom severity was categorised as follows: 1 represented 'No symptoms', 2–4 represented 'Mild symptoms', 5–7 represented 'Moderate symptoms', and 8–10 represented 'Severe symptoms'. This categorisation was used in previous QoL Studies among untreated menopausal women (Jokinen *et al.* 2003, Lipasti *et al.* 2021, 2023, 2025).

Statistical analyses

The Pearson's χ^2 test was used to identify potential sociodemographic differences between participants and excluded women with respect to background variables (age, couple relationships, place of residence, and basic and professional education). To examine differences in symptom occurrence between the two psychosocial work environments, unadjusted binary logistic regression analyses were first performed, followed by models adjusted for age group, menopausal status, and professional education. An alpha level of 0.05 was selected to indicate statistical significance. Statistical analyses were performed using SAS software (SAS 9.4, SAS Institute Inc., Cary, NC, USA, 2020).

Ethical approval and reporting guidelines

Ethical approval for the HeSSup Study, of which the QoL Study is a sub-study, was granted by the joint Ethics Committee of the University of Turku and Turku University Central Hospital. The study complied with the Declaration of Helsinki, and all participants provided written informed consent. The present study adheres to STROBE guidelines.

Results

When comparing the participants ($n=338$) with excluded women ($n=2,153$), the proportion of younger women (aged 52–56 years) was higher among participants ($p<0.001$). Participants also had higher levels of basic education ($p<0.001$) and professional education ($p=0.002$) compared with the excluded women (Table 1).

Regarding menopausal status, 13.0% of the participants were premenopausal, 12.8% were perimenopausal, and 53.6% were postmenopausal; those not classified (20.6%) were included in the analyses to maintain sample representativeness and minimise selection bias.

The most common symptoms were hot flushes, sweats, and sleeping problems, all categorised as vasomotor symptoms. These were followed by loss of sexual desire (forming its own category), nervousness (an affective symptom), and vaginal dryness and tenderness (classified as urogenital symptoms) (Figure 2). The most severe symptoms were hot flushes, sweats, and loss of sexual desire; sleeping problems were also among the most severe symptoms reported (Figure 3).

Next, the 12 symptoms were examined according to participants' experience of the psychosocial work environment. Among participants in either low-strain or high-strain jobs ($n=164$), the mode was five symptoms ($n=24$, 15%) followed by 10 different symptoms ($n=20$, 12%). It was also common to experience four ($n=18$, 11%), six or eight different symptoms ($n=17$, 10% for each). Experiencing all 12 symptoms was reported by nine participants (5%) (Supplementary Figure S1). The average number of symptoms among these women was six.

Participants in high-strain jobs ($n=79$) experienced higher number of different symptoms than those in low-strain jobs ($n=85$) For instance, experiencing 10–12 different symptoms was more common in high-strain jobs than in low-strain jobs ($p=0.019$) (Supplementary Figure S2). The arithmetic mean number of symptoms was seven in high-strain and six in low-strain jobs.

When the occurrence of symptoms was measured dichotomously (No/Yes), women in high-strain jobs experienced more urinary incontinence (OR 3.05; 95% CI 1.35–6.91; $p=0.008$) and depressive symptoms (OR 2.23; 95% CI 1.03–4.86; $p=0.043$) than those in low-strain jobs, after adjusting for age group, menopausal status, and professional education (Table 2).

Finally, focusing on the three most common climacteric symptoms among all participants (hot flushes, sweats, and sleeping problems) by their experience of the psychosocial work environment (low-strain vs high-strain jobs), participants in high-strain jobs experienced sweats more severe than women in low-strain jobs ($p=0.038$) (Figure 4).

Discussion

Summary of the main results

This study found that the most common climacteric symptoms among a pooled group of Finnish women aged 52–66 years – all of whom worked full-time and were surveyed before receiving any treatment for their symptoms – were hot flushes, sweats, sleeping problems, loss of sexual desire, nervousness, and vaginal dryness and tenderness. The most severe symptoms were hot flushes, sweats, loss of sexual

Table 1. Sociodemographic characteristics of the participants ($n=338$) and excluded women ($n=2,153$): Finnish nationwide HeSSup and QoL studies.

	Participants		Excluded women		
Characteristic	%	*n*	%	*n*	*p*[a]
Age (years in 2010)					<0.001
52–56	92.8	387	40.2	1039	
62–66	7.2	30	59.8	1547	
Couple relationship					0.17
No	16.1	52	19.4	400	
Yes	83.9	270	80.6	1666	
Place of residence (type of municipality)					0.85
Urban (with ≥15,000 inhab.)	61.8	209	62.3	1339	
Semi-urban (with 4,000–14,999 inhab.)	18.1	61	16.9	363	
Rural (with <4,000 inhab.)	20.1	68	20.8	448	
Basic education					<0.001
Less than 9 years	24.5	83	37.9	816	
9 years	31.7	107	26.7	573	
More than 9 years	43.8	148	35.4	760	
Professional education					0.002
No professional education	7.1	24	13.9	296	
Vocational course or school/ Apprenticeship contract	31.1	105	32.9	702	
College	42.3	143	36.5	780	
University	19.5	66	16.7	357	

[a]Pearson's χ^2 test.

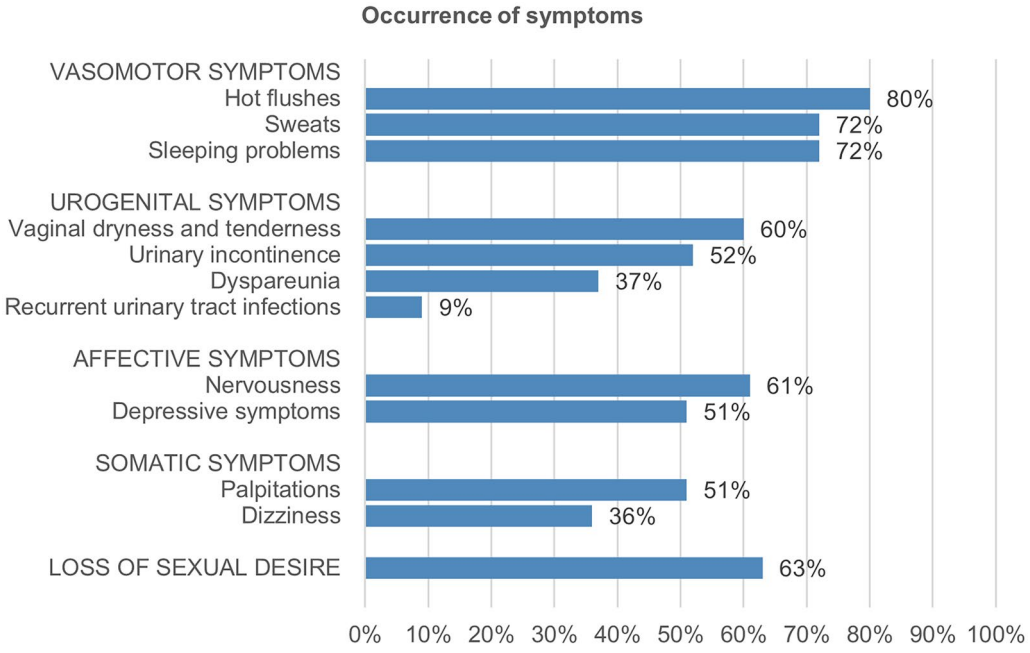

Figure 2. Occurrence (%) of climacteric symptoms in a group of untreated full-time working women ($n = 338$): Finnish nationwide HeSSup and QoL studies.

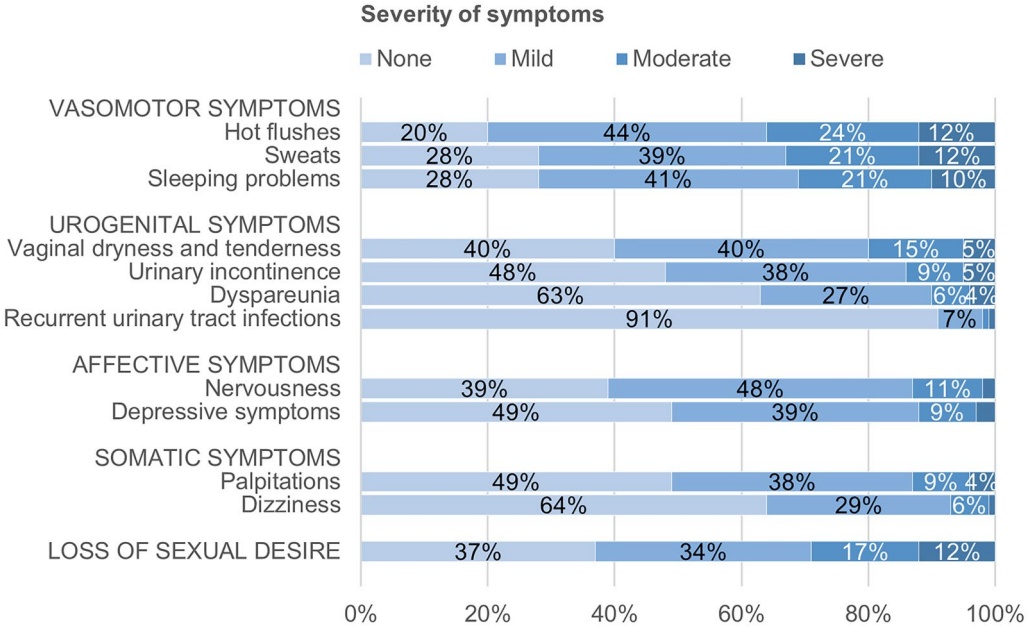

Figure 3. Severity (%) of climacteric symptoms in a group of untreated full-time working women ($n = 338$): Finnish nationwide HeSSup and QoL studies.

desire, and sleeping problems. The results indicated that women in either low-strain or high-strain jobs most often experienced five or ten different symptoms. Those in high-strain jobs experienced a higher number of different symptoms compared with those in low-strain jobs. Moreover, women in high-strain jobs experienced urinary incontinence and depressive symptoms more often than those in low-strain jobs. These associations reached statistical significance only after adjusting for age group, menopausal status, and professional education, confirming the independent role of the psychosocial work environment. Furthermore, women in high-strain jobs experienced more severe sweats than those in low-strain jobs.

Table 2. Occurrence of climacteric symptoms in a pooled group of untreated full-time working Finnish women in low-strain ($n = 85$) or high-strain jobs ($n = 79$): Finnish nationwide HeSSup and QoL studies.

	Low-strain		High-strain		Crude model[a]		Adjusted model[b]	
Symptoms	%	*n*	%	*N*	OR (95% CI)	*p*	OR (95% CI)	*p*
Vasomotor symptoms								
Hot flushes	69.7	57	80.5	62	0.54 (0.22–1.34)	0.18	2.57 (0,91–7.30)	0.08
Sweats	78.1	64	87.0	67	0.74 (0.27–2.00)	0.55	1.94 (0.71–5.34)	0.20
Sleeping problems	72.8	59	76.9	60	1.03 (0.43–2.47)	0.95	1.35 (0.58–3.15)	0.49
Urogenital symptoms								
Dyspareunia	32.0	25	41.1	30	0.51 (0.15–1.71)	0.27	1.88 (0.79–4.46)	0.15
Recurrent urinary tract infections	8.8	7	16.2	12	0.70 (0.22–2.28)	0.55	2.54 (0.72–8.92)	0.14
Urinary incontinence	43.0	34	60.5	46	0.59 (0.29–1.20)	0.14	3.05 (1.35–6.91)	0.008
Vaginal dryness and tenderness	51.0	42	56.0	42	1.31 (0.49–3.56)	0.59	1.06 (0.47–2.38)	0.89
Affective symptoms								
Depressive symptoms	47.5	38	62.3	48	0.81 (0.32–2.01)	0.65	2.23 (1.03–4.86)	0.043
Nervousness	58.0	47	68.8	53	1.01 (0.37–2.77)	0.99	1.56 (0.70–3.50)	0.28
Somatic symptoms								
Dizziness	32.7	26	37.3	28	0.98 (0.41–2.34)	0.96	1.16 (0.51–2.62)	0.73
Palpitations	52.6	41	53.3	40	1.26 (0.55–2.88)	0.58	0.99 (0.46–2.14)	0.98
Loss of sexual desire	63.3	50	62.7	47	0.50 (0.21–1.22)	0.13	1.01 (0.45–2.27)	0.98

[a]Binary response logistic regression analyses with single predictor.
[b]Binary response logistic regression analyses with age group, menopausal status, and professional education as covariates.

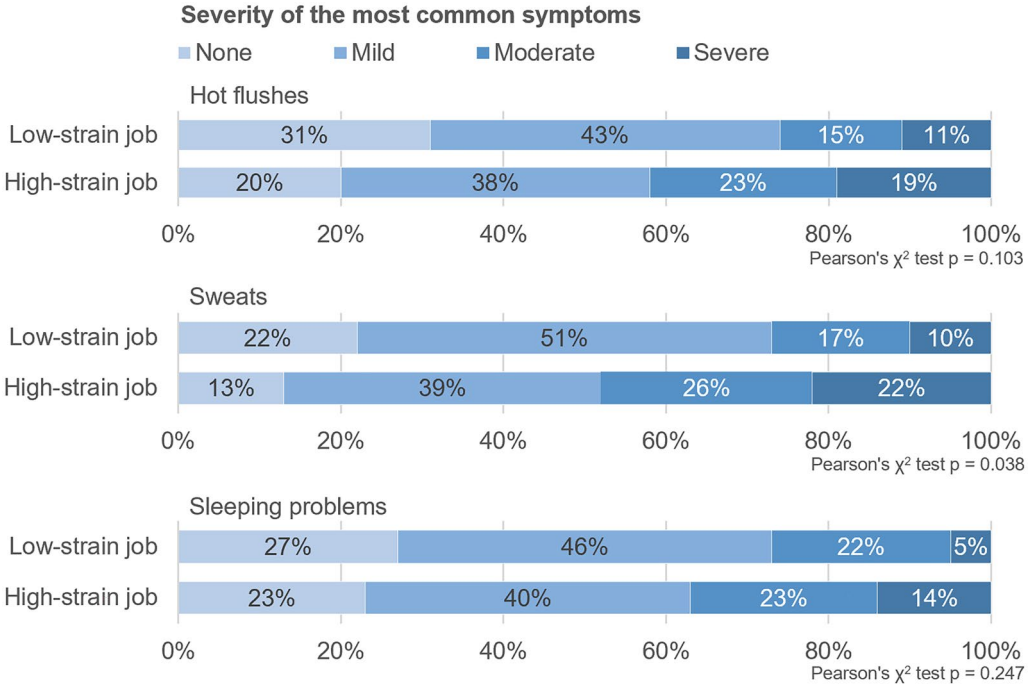

Figure 4. Severity (%) of the most common climacteric symptoms in a group of untreated full-time working women in low-strain ($n = 85$) or high-strain ($n = 79$) jobs: Finnish nationwide HeSSup and QoL studies.

Comparison with previous studies

Many of the findings align with previous research on the experience of climacteric symptoms (Dennerstein *et al.* 2000, Col *et al.* 2009, Hashimoto *et al.* 2020, Frankenthal *et al.* 2024). However, a unique aspect of this study – distinguishing it from much of the existing literature – is the focus on women in full-time employment who had not received any treatment for their symptoms.

The study was prompted by the little research-based information available on the experience of climacteric symptoms in relation to working hours and the experience of the psychosocial work environment, especially among untreated women. In addition to our previous findings (Lipasti *et al.* 2025), this

study was motivated by the large number of full-time working menopausal women in Finland and their societal importance. This group includes women who, for various reasons, do not use any treatment for their climacteric symptoms. The present study significantly extends our previous research on the experience of untreated full-time working women.

Clinical implications

When applying the results of this study, it is important to consider individual variations in the age of menopause attributed to factors such as genetics (Laven 2015). Symptoms may also vary by ethnicity (Tanbo and Fedorcsak 2021). Furthermore, cultural factors may influence how women experience both their climacteric symptoms and their work environment (Jones *et al.* 2012). Nevertheless, many climacteric symptoms remain universal.

The findings provide valuable insights for healthcare professionals in primary and secondary care when supporting middle-aged women. The results may also benefit workplaces and help women themselves become more aware of climacteric symptoms. Reliable, research-based information is vital for both healthcare professionals and the general public, as online information regarding the menopause is not always accurate (Charbonneau 2012); raising awareness about climacteric symptoms and their impact on well-being is necessary within both healthcare settings and the workplace.

Healthcare professionals play a crucial role in promoting the health of middle-aged and menopausal women (Hillard and Abernethy 2015, Lambrinoudaki *et al.* 2022). By providing accurate health promotion, they can strengthen women's knowledge of midlife physiological changes, increase understanding of climacteric symptoms and help women to cope with them through effective strategies. The support should extend beyond healthcare settings to include guidance within the workplace. To succeed, healthcare professionals must be equipped with the necessary knowledge, skills, and attitudes to support menopausal women, including those who may be hesitant or prefer not to use treatment. High-quality professional education is essential to achieve this goal.

Strengths and limitations

A key strength of the present study is its nationwide design. To reduce potential bias, differences between participants and excluded women were carefully examined. However, certain limitations must be acknowledged. The reliance on self-reported data introduces the possibility of recall bias, which may lead to under- or overestimation of symptoms and the experience of the work environment; nonetheless, the recall period was relatively short. Another potential source of bias is the absence of women aged 57–61 from the group. Furthermore, the sample size was relatively small due to exclusions (for context, at the time of this study, approximately 30–40% of Finnish women were HRT-users (Holm *et al.* 2014)). This sample size may have resulted in some findings lacking statistical significance.

Moreover, the results may be limited by the use of a non-validated questionnaire to measure symptoms. It can also be argued that the findings are no longer relevant because the data date from 2010. However, this remains the most recent QoL survey available; additionally, many women who participated in the present study are still at an age at which they may experience climacteric symptoms. We believe that the data remain appropriate for studying this topic within an ever-changing working life (i.e. characterised by increasing demands and prolonged working careers).

Conclusion

The findings indicate that bothersome climacteric symptoms—particularly hot flushes, sweats, sleeping problems, and loss of sexual desire—are a reality for many full-time working women aged 52–66 years. In addition to addressing these symptoms, healthcare professionals should pay special attention to women working in high-strain jobs. The results also provide important insights for employers and managers seeking to support their workforce.

Author contributions

CRediT: **Maija Lipasti**: Conceptualization, Data curation, Visualization, Writing – original draft, Writing – review & editing; **Jaana Jalava-Broman**: Conceptualization, Data curation, Writing – review & editing; **Lauri Sillanmäki**: Conceptualization, Data curation, Formal analysis, Writing – review & editing; **Juha Mäkinen**: Conceptualization, Data curation, Supervision, Writing – review & editing; **Päivi Rautava**: Conceptualization, Data curation, Supervision, Writing – review & editing.

Disclosure statement

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Data availability statement

There are no linked research datasets for this submission. Following the EU General Data Protection Regulation (GDPR) and Finnish legislation concerning sensitive data such as health-related information, the authors are not authorised to share the data with external parties.

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