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Original article

Perimenopause: Symptoms, work ability and health among 4010 Dutch workers

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ABSTRACT

Objective: In this study we examined the associations between menopausal symptoms and work ability and health among a general population of Dutch female workers.
Study design: This nationwide cross-sectional study was a follow-up of the Netherlands Working Conditions Survey 2020. In 2021, 4010 Dutch female employees aged 40–67 years completed an online survey on a variety of topics, including menopausal symptoms, work ability and health.
Methods: Linear and logistic regression analyses were performed to investigate the association between the degree of menopausal symptoms with work ability, self-rated health and emotional exhaustion, after adjustment for potential confounders.
Results: Almost one-fifth of participants were in the perimenopause ($n = 743$). Of these women, 80 % experienced menopausal symptoms: 27.5 % 'often' and 52.5 % 'sometimes'. Experiencing menopausal symptoms was associated with lower work ability, poorer self-rated health, and more emotional exhaustion. These associations were most pronounced among perimenopausal women 'often' experiencing symptoms.
Conclusions: Menopausal symptoms threaten the sustainable employability of female workers. Interventions and guidelines are needed to support women, employers and (occupational) health professionals.

1. Introduction

Women's input in economic productivity is becoming more and more important for today's society. Labor-force participation among women has been steadily rising from 60.6 % in 2010 to 65.3 % in 2021 [1], and the proportion of women employed after the age of 45 has particularly increased over the past decade [2]. In 2021, 1.9 million Dutch women aged 45 years and older were in paid employment, which accounts for half of the women in the Dutch working population [3].

As a result of the rise in workforce participation among women aged 45 to 64 years in OECD countries, an increasing number of women are experiencing the menopausal transition while in paid employment [2]. The menopause – or final menstruation period – occurs on average at 51 years in Western countries [4,5]. For most women, the perimenopause begins four years before the last menstrual period, and is defined by menstrual cycle and endocrine changes [4]. Women often experience, to a greater or lesser extent, symptoms during perimenopause, which may persist for up to 5–7 years following the final menstrual period [6].Well-known menopausal symptoms include hot flashes, night sweats, and vaginal dryness [7]. Other symptoms may include disturbed sleep, irritability, and loss of concentration, as well as muscle or joint pain [8–10]. Headaches and migraines may also worsen during perimenopause [9]. These symptoms negatively impact various aspects of a woman's quality of life, including general health and well-being [4,5,11,12].

Menopausal symptoms can also influence the performance of women at work. A growing body of evidence shows that menopausal symptoms are negatively associated with women's self-perceived ability to work [11,13,14]. For instance, over 75 % of women visiting an outpatient clinic for severe menopausal symptoms, report a low ability to perform their work [11]. Moreover, Gartoulla et al. [2] showed that women experiencing menopausal vasomotor symptoms, or hot flushes and night sweats, are more likely to report poorer work ability. Having problematic hot flushes at work is in fact associated with a higher intention to

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stop working [15]. Overall, these findings suggest that menopausal symptoms may increase the risk of work absenteeism [13], and therewith also create a substantial economic burden for employers and society [16].

Previous studies either specifically focused on hot flushes in midlife women, symptomatic women who attended an out-patient menopause clinic, or women within the perimenopausal phase. Therewith, the extent to which women experience menopausal symptoms within the general working population at large remains unknown. Against this background, the aims of this study were (a) to determine the proportion of female workers in the perimenopausal stage, (b) the extent to which female workers in the perimenopausal stage experience menopausal symptoms, and (c) to investigate the associations between menopausal symptoms, work ability and health among Dutch female workers in the perimenopausal phase.

2. Methods

This study was designed as a nationwide cross-sectional study. The TNO Internal Review Board approved the study and assessed the study as not being subject to the requirements of the Medical Research Human Subjects Act (ID number: 2021-094). The study followed all recommendations with regard to the privacy aspects including an informed consent, information letter and the possibility to voluntarily discontinue participation.

2.1. Dataset and population

The current study is a follow-up study of the annual Netherlands Working Conditions Survey (NWCS) 2020, which has been extensively described elsewhere [17]. Female workers aged 40 to 75 years who granted permission were approached to participate in the current study ($N = 10{,}858$). Participants received an online questionnaire on a variety of topics, including demographics, menopausal symptoms, lifestyle factors, work ability, and health. The first invitation was sent in October 2021, followed by two reminders in November 2021. The finale response rate was 41.5 % ($N = 4506$). For the current study, we excluded (1) women of 67 years and older as they were above the statutory retirement age, (2) women who did not report their menopausal status, and (3) women with an absence of menses due to pregnancy, breast feeding, or other medical reasons. This resulted in a final sample of $N = 4010$ female employees (Fig. 1).

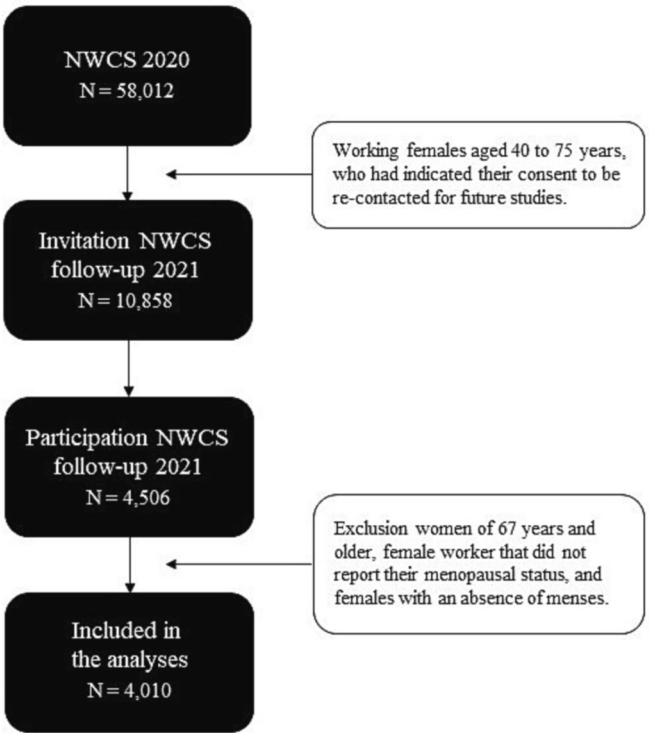

Fig. 1. Flowchart of the study sample.

2.2. Survey measures

2.2.1. Menopausal status, degree of menopausal complaints

Menopausal status was determined by self-report on menstruation pattern: (i) regular menstrual period, defined as the premenopausal stage, (ii) irregular menstrual periods and probably in the menopause, defined as the perimenopausal stage, and (iii) absence of menstrual periods due to the menopause, defined as the postmenopausal stage. The current study did not include questions on medication use (e.g. hormone replacement therapy or progesterone-containing oral contraceptive pills) or the Mirena coil.

Within the perimenopausal group, symptom severity was assessed with a single question on the degree of menopausal complaints, scored (1) "no", (2) "yes, sometimes", or (3) "yes, regularly".

2.2.2. Greene Climacteric Scale

Menopausal symptoms were measured with the Greene Climacteric Scale (GCS). The GCS is a 21-item validated self-report scale that measures the severity of symptoms associated with the menopausal transition [18].

The severity of each item is based on an 4-point scale (0) "not existing", (1) "occasionally", (2) "often" and (3) "very often". The total score ranges from 0 to 63. Scoring also generates four domain scores: psychological (11 symptoms, score: 0–33), somatic (7 symptoms, score: 0–21), vasomotor (2 symptoms, score: 0–6), and sexual functioning (1 symptom, score: 0–3). Higher scores indicate more (frequent or severe) symptoms.

2.2.3. Work ability

Work ability was measured using the first dimension of the Work Ability Index (WAI), in which the female workers assessed their current ability to work compared to lifetime best [19]. The answer scale ranged from (0) "unable to work" to (10) "work ability in the best period of my life". This single item is highly correlated with the total WAI score [20].

2.2.4. Health

Self-rated health was measured with a single-item question. Respondents could indicate whether their health was very good, good, fair, poor or very poor. Self-rated health was dichotomized into poor health (very poor, poor, or fair) and good health (good or very good).

Emotional exhaustion was measured with five items based on the emotional exhaustion scale from the validated Utrecht Burnout Scale (UBOS) [21]. Using a seven-point scale ranging from "never" (1) to "every day" (7), respondents were asked to report the applicability of five statements that refer to emotional exhaustion (e.g., "I feel emotionally exhausted by my work"). The mean score of the five items was calculated and ranged from 1 to 7. Based on the mean cut-off value of 3.2 [17], the score was dichotomized into "not emotionally exhausted" and "emotionally exhausted".

2.2.5. Lifestyle factors

BMI was derived from self-reported weight and height of participants and expressed in kg/m^2. Participants with a BMI of 25 or above were identified as overweight or obese. Smoking behavior was defined by questioning current smoking status and dichotomized as "current smoker" and "never or previously smoked". Alcohol use was measured as number of alcohol consumptions per week. Physical activity was assessed using the number of days per week with "moderate" physical activity for 30 min or more outside work (e.g., brisk walking or cycling),

and "vigorous" physical activity for at least 20 min per session outside work, causing sweating or running out of breath [22].

2.2.6. Other variables

Age was included as a continuous variable; educational level was measured as the highest level of completed education, and was categorized into low, intermediate and high educational level. Weekly working hours, working-from-home hours and type of work were based on participants' self-report on the NWCS 2020 [17]. Weekly working hours was categorized into part-time (i.e., <36 h per week) and full-time (i.e., ≥36 h per week). Type of work was categorized as a contact, white collar or blue collar profession by using information on occupation in the NWCS 2020 based on the International Standard Classification of Occupations 2008 (ISCO-08) coding scheme with four-digit codes describing 436 job titles. Blue collar workers mainly perform manual labor, while white collar workers a mainly work behind a computer or desk. Individuals working in a contact profession have regular contact with other (e.g., patients, students, clients).

2.3. Statistical analyses

Descriptive statistics were performed for (1) the overall sample, (2) menopausal status subgroups, and (3) self-perceived symptom severity subgroups within the perimenopausal women. Chi-squares and one-way ANOVAs with Tukey HSD post-hoc tests ($\alpha < 0.05$) were used to determine the differences between menopausal subgroups, and within perimenopausal women.

We regressed work ability against the severity of menopausal symptoms by a linear regression analysis. Self-rated health and emotional exhaustion were regressed against the severity of menopausal symptoms by logistic regression analyses. First, univariate analyses between menopausal symptoms and work ability, self-rated health and emotional exhaustion were conducted. In the second step, the analyses were controlled for confounders including age, educational level, part-time vs. full-time work, BMI, and all lifestyle factors. All analyses were performed using SPSS Version 24.0.

3. Results

Sample characteristics are presented in Table 1. Mean age was 53.1 years and an intermediate (42.7 %) educational level was most common. The majority of women worked in contact professions (65.2 %).

3.1. Proportion of women in each menopausal stage and characteristics

Of all respondents, 26.0 % ($N = 1041$) still experienced regular cycles, i.e. were in the premenopausal stage, 18.5 % ($N = 743$) of the respondents experienced irregular menses (i.e., the perimenopausal stage), and more than half of the respondents (55.5 %; $N = 2226$) were in the postmenopausal stage.

With menopausal stage, women were older and appeared to work less hours per week, and worked more part-time (Table 1). Regarding lifestyle factors, perimenopausal women (24.1 %) were – on average – more often overweight or obese than postmenopausal women (19.6 %), but showed no significant differences with premenopausal women (20,9 %). Women in the perimenopausal stage showed higher overall scores on the GCS (16.2) compared to both premenopausal (11.7) and postmenopausal women (12.3). Also on the 4 domains of the GCS (i.e., psychological, somatic, vasomotor, and sexual), perimenopausal women reported more severe menopausal symptoms – see Table 1 for details.

Table 1
Characteristics of the overall sample, and stratified by menopausal status.

	Overall Sample $N = 4010$ 100 %	Premenopausal $N = 1041$ 26.0 %	Perimenopausal $N = 743$ 18.5 %	Postmenopausal $N = 2226$ 55.5 %
Age – Mean (SD)	53.1 (6.9)	45.4 (3.4)$_a$	49.3 (3.8)$_b$	58.1 (4.4)$_c$
Educational Level				
Low	19.9 %	12.0 %$_a$	13.6 %$_a$	25.6 %$_b$
Intermediate	42.7 %	40.6 %$_a$	45.5 %$_b$	42.8%$_c$
High	37.4 %	47.3%$_a$	41.0 %$_b$	31.6 %$_c$
Working Hours – Mean (SD)	28.5 (8.6)	29.9 (7.8)$_a$	29.6 (8.5)$_a$	27.5 (8.8)$_b$
Part-time: <36 h per week	76.4 %	72.3%$_a$	73.8%$_a$	78.9 %$_b$
Full-time: ≥36 h per week	23.6 %	29.7 %$_a$	26.2 %$_a$	21.1 %$_b$
Working Hours from Home – Mean (SD)	16.8 (11.4)	18.6 (11.8)$_a$	16.9 (11.6)$_{a,b}$	15.8 (11.1)$_b$
Type of Work				
Contact Professions	65.2 %	61.7 %$_a$	65.1 %$_{a,b}$	66.8%$_b$
White Collar	28.4 %	31.9 %$_a$	29.3%$_{a,b}$	26.4 %$_b$
Blue Collar	6.4 %	6.4 %$_a$	5.6 %$_a$	6.8%$_a$
GCS Score – Mean (SD)				
Overall Symptoms (0–63)	12.9 (8.3)	11.7 (7.8)$_a$	16.2 (9.5)$_b$	12.3 (7.8)$_a$
Psychological Symptoms (0−33)	7.0 (5.1)	7.0 (5.2)$_a$	8.7 (5.8)$_b$	6.4 (4.7)$_c$
Somatic Symptoms (0−21)	3.7 (2.9)	3.4 (2.8)$_a$	4.6 (3.4)$_b$	3.5 (2.8)$_a$
Vasomotor Symptoms (0–6)	1.2 (1.5)	0.5 (0.8)$_a$	1.7 (1.7)$_b$	1.4 (1.6)$_c$
Sexual Symptoms (0–3)	1.0 (1.0)	0.8 (0.9)$_a$	1.2 (1.0)$_b$	1.1 (1.0)$_b$
Lifestyle Factors				
BMI, overweight or obesity	20.7 %	20.9 %$_{a,b}$	24.1 %$_a$	19.6 %$_b$
Current Smoker	11.2 %	11.5 %$_a$	9.5 %$_a$	11.5 %$_a$
Alcohol Use – Mean (SD) Glasses per Week	2.8 (4.2)	2.4 (3.7)$_a$	2.4 (4.1)$_a$	3.1 (4.5)$_b$
Physical Activity – Mean (SD) Days per Week				
Moderate Exercise	4.5 (2.0)	4.4 (2.0)$_a$	4.4 (1.9)$_{a,b}$	4.6 (2.0)$_b$
Intensive Exercise	1.5 (1.5)	1.4 (1.4)$_a$	1.6 (1.6)$_a$	1.4 (1.5)$_a$
Work Ability (0−10) – Mean (SD)	7.6 (1.7)	7.7 (1.8)$_a$	7.4 (1.7)$_b$	7.6 (1.5)$_a$
Poor Health	20.9 %	15.6 %$_a$	23.1 %$_b$	22.9 %$_b$
Emotional Exhaustion	20.1 %	19.8%$_a$	27.1 %$_b$	17.9 %$_a$

Note. Means and frequencies **not** sharing subscripts in each row are significantly different from each other at $\alpha = 0.05$, as indicated by Tukey's HSD and chi-square testing, respectively.
For instance, premenopausal and perimenopausal women do not differ in "Working Hours", given that the means share the subscript a. Yet, a significant difference in "Working Hours" exists between premenopausal and postmenopausal women, as these means are not sharing subscripts.
Abbreviations: SD, standard deviation; BMI, Body Mass Index; GCS, Greene Climacteric Scale.

Work ability was on average slightly lower in women in the perimenopausal stage (7.4) than women in the premenopausal (7.7) as well as postmenopausal stage (7.6). Women in both the perimenopausal (23.1 %) and postmenopausal stage (22.9 %) reported more often poor health than premenopausal women (15.6 %). In the perimenopausal group, women reported more often emotional exhaustion (27.1 %) than both premenopausal (19.8 %) and postmenopausal women (7.9 %).

3.2. Female workers in the perimenopausal stage experiencing menopausal symptoms

Of all women in the perimenopausal stage, 79.9 % reported to experience menopausal symptoms, of which 52.5 % sometimes and 27.5 % often (Table 2). Women often experiencing menopausal symptoms appeared to work less hours per week (28.6) and more part-time (79.1 %) than women with no symptoms (30.8 and 68.1 %, respectively). Perimenopausal women often experiencing symptoms showed – on average – more overweight and obesity (30 %) than women without symptoms (18.2 %). Women without any symptoms drunk on average significant more glasses of alcohol per week (3.3) than women often experiencing symptoms (1.9).

GCS scores gradually increased with symptoms severity: women often experiencing symptoms showed higher overall GCS scores (21.9) compared to women sometimes experiencing symptoms (15.5) as well as women without any symptoms (10.4). Similar patterns were found for the four separate domains of the GCS – see Table 2 for details. Fig. 2 shows the ten most common symptoms experienced by women in the perimenopausal stage based on the GCS. Tiredness or fatigue, low sex drive and muscle or joint pain are the three most common mentioned symptoms for both women sometimes experiencing and women often experiencing symptoms.

Perimenopausal women often experiencing symptoms reported a lower work ability (6.9) compared to both women sometimes experiencing symptoms (7.5) and without symptoms (7.8; Table 2). Moreover, women often experiencing symptoms more frequently reported emotional exhaustion as well as poor health (38.9 % and 37.5 %, respectively) compared to women sometimes experiencing symptoms (26.3 % and 19.1 %, respectively) and women without any symptoms (13.4 % and 14.1 %, respectively).

3.3. Associations between menopausal symptoms, work ability and health

Table 3 shows the univariate and multivariate analyses in which work ability, self-rated health, and emotional exhaustion among perimenopausal women were regressed against the severity of menopausal symptoms. Work ability and self-rated health gradually increased and emotional exhaustion gradually decreased by degree of symptoms. More specific, the multivariate analyses showed that perimenopausal women with sometimes and often experiencing menopausal symptoms had a lower work ability (B = −0.54, 95 % CI −0.84: −0.24 and B = −1.15, 95 % CI −1.49: −0.81, respectively) compared to women without any symptoms. Regarding self-rated health, sometimes and often experiencing menopausal symptoms was associated with a higher likelihood of poor self-rated health than no symptoms (OR = 1.88, 95 % CI 1.04: 3.41 and OR = 4.86, 95 % CI 2.62: 9.04, respectively). Women sometimes experiencing menopausal symptoms (OR = 3.20, 95 % CI 1.77: 5.79) as well as often experiencing menopausal symptoms (OR = 6.07, 95 % CI 3.25: 11.31) were more likely to be emotional exhausted than women without any symptoms.

4. Discussion

In this large nationwide study, almost one fifth of female workers aged 40 to 67 years were in the perimenopausal stage. These women showed higher GCS scores, more emotional exhaustion, and a slightly lower work ability compared to both premenopausal and postmenopausal women. In line with existing literature [23–25], 80 % of the women within the perimenopausal stage experienced menopausal symptoms (i.e., 27.5 % often, and 52.5 % sometimes). Experiencing menopausal symptoms – either sometimes or often – was associated with lower work ability, poorer self-rated heath, and more emotional exhaustion. These associations were most pronounced among perimenopausal women often experiencing symptoms.

The menopause is a normal aging phenomenon, which many women go through during working life. While the type and severity of symptoms may vary, the current study shows that almost 80 % of perimenopausal women experiences symptoms to some extent. Our findings align with a

Table 2
Characteristics of women in the perimenopausal period without, and with sometimes or often experiencing menopausal symptoms.

	Perimenopausal Women, N = 743		
	Without Menopausal Symptoms $N = 150$ 20.2 %	Sometimes Menopausal Symptoms $N = 390$ 52.5 %	Often Menopausal Symptoms $N = 204$ 27.5 %
Age – Mean (SD)	49.6 (3.6)$_a$	49.4 (3.8)$_a$	48.8 (3.9)$_a$
Educational Level			
Low	11.9 %$_a$	12.3%$_a$	17.2 %$_a$
Intermediate	45.9 %$_a$	46.1 %$_a$	43.8%$_a$
High	42.2 %$_a$	41.6 %$_a$	39.0 %$_a$
Working Hours – Mean (SD)	30.8 (9.4)$_a$	29.7 (8.5)$_{a,b}$	28.6 (7.7)$_b$
Part-time: < 36 h per week	68.1 %$_a$	73.2 %$_{a,b}$	79.1 %$_b$
Full-time: ≥ 36 h per week	31.9 %$_a$	26.8%$_{a,b}$	20.9 %$_b$
Working Hours from Home – Mean (SD)	17.0 (13.9)$_a$	17.8 (11.0)$_a$	15.0 (10.7)$_a$
Type of Work			
Contact Professions	63.3%$_{a,b}$	62.5 %$_a$	71.4 %$_b$
White Collar	31.7 %$_a$	31.1 %$_a$	24.3%$_a$
Blue Collar	5.1 %$_a$	6.4 %$_a$	4.3%$_a$
GCS Score – Mean (SD)			
Overall Symptoms (0–63)	10.4 (8.8)$_a$	15.5 (7.6)$_b$	21.9 (10.3)$_c$
Psychological Symptoms (0–33)	5.6 (5.5)$_a$	8.4 (4.8)$_b$	11.6 (6.5)$_c$
Somatic Symptoms (0–21)	2.8 (2.8)$_a$	4.4 (3.0)$_b$	6.2 (3.8)$_c$
Vasomotor Symptoms (0–6)	1.1 (1.4)$_a$	1.5 (1.4)$_b$	2.6 (1.9)$_c$
Sexual Symptoms (0–3)	0.9 (1.0)$_a$	1.1 (1.0)$_a$	1.5 (1.1)$_b$
Lifestyle Factors			
BMI, overweight or obesity	18.2 %$_a$	23.3%$_{a,b}$	30.0 %$_a$
Current Smoker	9.9 %$_a$	9.0 %$_a$	10.2 %$_a$
Alcohol Use – Mean (SD) Glasses per Week	3.3 (5.9)$_a$	2.4 (3.8)$_{a,b}$	1.9 (2.6)$_b$
Physical Activity – Mean (SD) Days per Week			
Moderate Exercise	4.6 (1.9)$_a$	4.3 (1.9)$_a$	4.5 (2.0)$_a$
Intensive Exercise	1.5 (1.7)$_a$	1.6 (1.5)$_a$	1.6 (1.5)$_a$
Work Ability (0–10) – Mean (SD)	7.8 (2.2)$_a$	7.5 (1.5)$_a$	6.9 (1.6)$_b$
Poor Health	14.1 %$_a$	19.1 %$_a$	37.5 %$_b$
Emotional Exhaustion	13.4 %$_a$	26.3%$_b$	38.9 %$_c$

Note. Means and frequencies **not** sharing subscripts in each row are significantly different from each other at α = 0.05, as indicated by Tukey's HSD and chi-square testing, respectively.
For instance, women without and sometimes menopausal symptoms do not differ in "Working Hours", given that the means share the subscript a. Yet, a significant difference in "Working Hours" exists between women without and often menopausal symptoms, as these means are not sharing subscripts.
Abbreviations: SD, standard deviation; BMI, Body Mass Index; GCS, Greene Climacteric Scale.

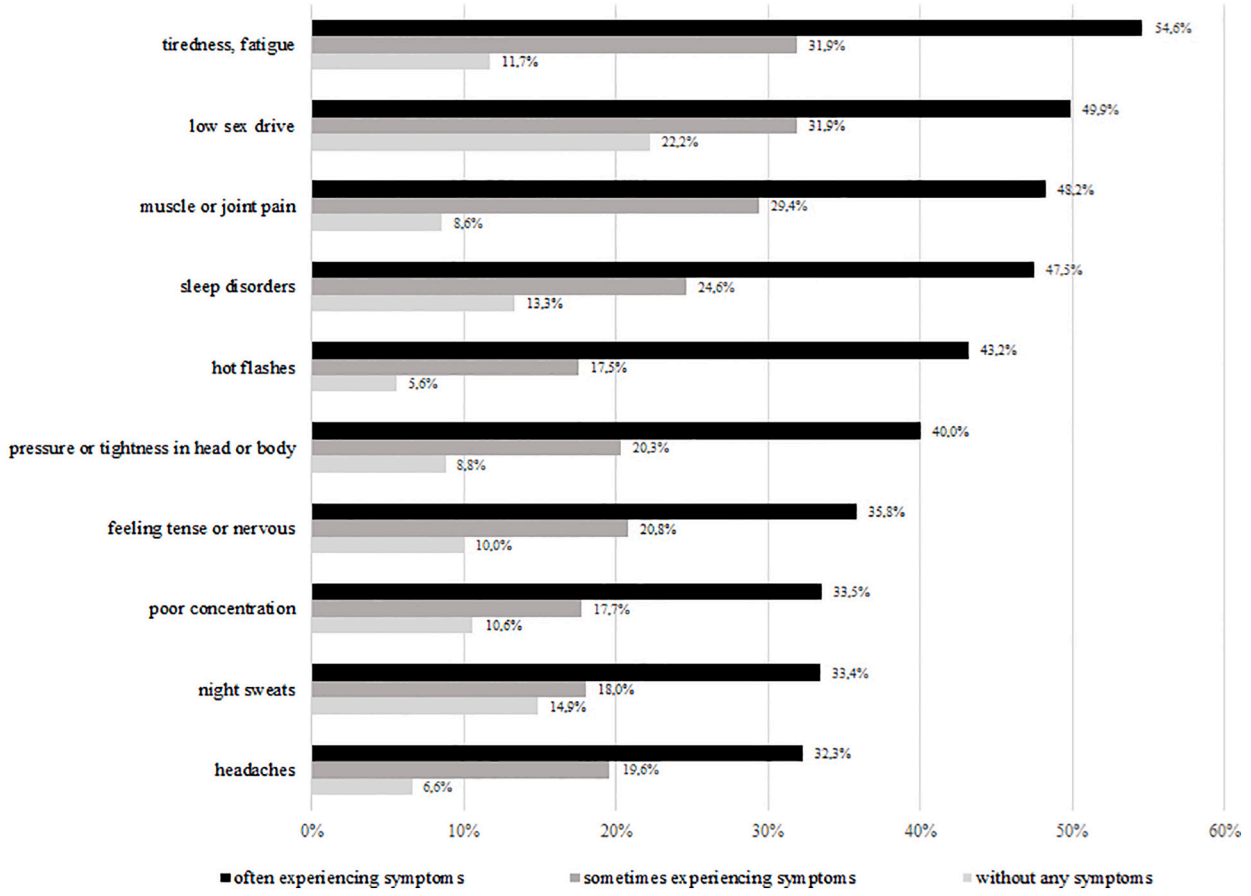

Fig. 2. The 10 most common symptoms of GCS during perimenopause, stratified for those without, with sometimes as well as often experiencing symptoms.

Table 3
Work ability, poor self-rated health and high emotional exhaustion regressed on the severity of menopausal symptoms among perimenopausal women.

	Univariate		Multivariate[a]	
Work Ability	B	95 % CI	B	95 % CI
Without Symptoms	ref		ref	
Sometimes Symptoms	−0.31	−0.63: 0.01	**−0.54**	**−0.84: −0.24**
Often Symptoms	**−0.96**	**−1.32: −0.60**	**−1.15**	**−1.49: −0.81**
Poor Self-Rated Health	OR	95 % CI	OR	95 % CI
Without Symptoms	ref		ref	
Sometimes Symptoms	1.43	0.85: 2.42	**1.88**	**1.04: 3.41**
Often Symptoms	**3.65**	**2.13: 6.27**	**4.86**	**2.62: 9.04**
High Emotional Exhaustion	OR	95 % CI	OR	95 % CI
Without Symptoms	ref		ref	
Sometimes Symptoms	**2.31**	**1.37: 3.89**	**3.20**	**1.77: 5.79**
Often Symptoms	**4.12**	**2.38: 7.13**	**6.07**	**3.25: 11.31**

Note. $p < 0.05$ in **bold**. Abbreviations: OR, odds ratio; CI, confidence interval.
[a] Adjusted for age, educational level, part-time vs. full-time work, BMI, and all lifestyle factors.

recent narrative review [14], stating that menopausal symptoms are associated with lower work ability, poorer health and depression. Indeed, previous cross-sectional studies showed that menopausal symptoms are negatively associated with women's self-perceived ability to work [2,11,13], while positively associated with emotional exhaustion [26]. Several symptoms, such as fatigue, sleep and concentration difficulties, may be especially problematic for the performance of women at work [27]. Additionally, a recent study from D'Angelo et al. [10] showed that female workers with financial problems also have more difficulties to cope with menopause problems. Moreover, workers in the perimenopause are also in their phase of life with relatively many informal care responsibilities (e.g. growing up children/adolescents and older parents), which might also influence their abilities to cope with menopause symptoms. Future research may consider to include variables such as household composition and informal care as covariates in their study. It should be noted that such menopausal symptomology may also be easily mistaken for burnout, thereby resulting in inadequate help from occupational physicians or general practitioners [14].

Given that menopausal symptoms may increase the risk of prolonged sickness absence from work [11], or the intention to leave employment [15], the menopause should be considered an important gender and age-equality issue at the worksite. Strikingly, Beck et al. [28] showed that there is still a taboo to talk about menopausal problems at work due to the fear of stigmatization. The majority of occupational physicians in fact recognizes this taboo culture [5], and perceives a lack of knowledge to accurately diagnose menopausal symptoms. Thus, the impact of the menopausal transition still remains largely unaddressed within organizations [14]. In 2021, the European Menopause and Andropause Society stated that it should be recognized that, for some women, menopausal symptoms adversely affect their work ability, and they provided recommendations for employers, healthcare professionals and women to make the workplace environment more menopause supportive [9,29]. In the Netherlands, guidelines for occupational physicians are lacking, but there is increased attention as recently a position statement was published about the adverse impact of the menopause on women's ability to work.

Despite the large dataset among a general population of female workers aged 40 years and older, this study has some limitations. First of all, the cross-sectional design does not allow for causal inferences to be made, as unmeasured confounders might explain the observed

differences between groups. Second, women often experiencing menopausal symptoms may have been on sick leave or unemployed at the time of measurement, leading to an underestimation of the prevalence of this specific group. Third, menopausal status was subjectively assessed with a single question on the (ir)regularity or absence of menstruation, and one could question the reliability of this item. The perimenopausal stage is officially defined as the time from the start of irregular periods until one year after the last menstruation, and therefore, some women may have been misclassified as already being in the post-menopausal stage. In line, the current study did not ask about medication use that influences menstruation (e.g. hormone replacement therapy), and women may have been misclassified as still menstruating. Moreover, it is unclear to what degree the findings in Dutch female employees may be generalized to working women in other countries. Future research should focus on collecting and analyzing longitudinal data to further unravel the causal relationship between menopausal symptoms, work ability and health. Especially of interest is to gain more insight into the influence of work-related factors on menopausal symptoms. Even though it has been suggested that exposure to pesticides, irregular working hours, and psychosocial working conditions might influences the severity of menopausal symptoms [14,30,31], the evidence is still inconclusive [31].

5. Conclusion

Women in the perimenopausal stage reported lower work ability, poorer self-rated health and more emotional exhaustion than women in the premenopausal stage. Eighty percent of all women in the perimenopausal stage reported menopausal symptoms (i.e., 27.5 % often, and 52.5 % sometimes). Moreover, menopausal symptoms were associated with lower work ability, poorer self-rated health and more emotional exhaustion, with the highest associations for women often experiencing menopausal symptoms. Therewith, menopausal symptoms threaten the sustainable employability of women. Workplace interventions and guidelines are helpful to support women, employers and health professionals to discuss symptoms and their impact on work, to recognize them appropriately and to stimulate work ability.

Contributors

Karen M. Oude Hengel participated in the development of the study as well as the collection and analyses of data, and writing of the manuscript.

Marieke Soeter participated in the analyses of the data and writing of the manuscript.

Merel in der Maur participated in the interpretation of the data and editing of the manuscript.

Sandra H. van Oostrom participated in the interpretation of the data and editing of the manuscript.

Bette Loef participated in the interpretation of the data and editing of the manuscript.

Wendela E. Hooftman participated in the development of the study, collection and analyses of data, and editing of the manuscript.

All authors saw and approved the final version of the paper.

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Ethical approval

The TNO Internal Review Board approved the study and assessed the study as not being subject to the requirements of the Medical Research Human Subjects Act (ID number: 2021-094). The study followed all recommendations with regard to the privacy aspects including an informed consent, information letter and the possibility to voluntarily discontinue participation.

Provenance and peer review

This article was not commissioned and was externally peer reviewed.

Research data (data sharing and collaboration)

There are no linked data sets for this paper. Data will be made available upon reasonable request.

Declaration of competing interest

The authors declare that they have no competing interest.

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