



# The impact of menopause on work ability in women with severe menopausal symptoms



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## ABSTRACT

**Objective:** To measure the impact of menopause on work ability in women with severe menopausal symptoms.

**Study design:** This cross-sectional study compared the work ability of a sample of otherwise healthy employed Dutch women (n = 205) with that of a sample of first-time attendees of a menopause clinic (n = 60); both groups were aged 44–60 years. Self-reported questionnaire data assessing work ability (Work Ability Index; WAI) and menopausal symptoms (Greene Climacteric Scale; GCS) were used.

**Main outcome measures:** Logistic regression analyses were used to examine whether women with severe menopausal symptoms were more likely to have low work ability (defined as a score <37.0 points on the WAI) than were women in the reference group, after adjustment for individual and lifestyle factors.

**Results:** Symptomatic women had significantly higher total GCS scores (mean 26.7 vs 14.2, t = 10.8, P < 0.001) and significantly lower WAI scores (median 32.0 vs 40.0, U = 2380, P < 0.001) than the reference group. They were 8.4 times more likely to report low work ability than their healthy counterparts: 76.7% versus 30.2% (OR 8.4, 95% CI 4.1–17.2).

**Conclusions:** Over three-quarters of symptomatic menopausal women report serious problems in dealing with the physical and mental demands of their work (recorded here as low work ability); hence these women might be at risk of prolonged sickness absence from work.

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## 1. Introduction

During menopause women experience many physiological changes, which may cause a wide variety of physical symptoms and psychological as well as social problems. Every day millions of women suffer from these peri- and post-menopausal complaints. Apart from the physical discomfort that accompanies the menopausal transition women might also experience a considerable impact on their capacity to deal with a normal work load [1,2].

In today's society, women's input in economic productivity is becoming more and more important. Statistics in The Netherlands predict that currently within The Netherlands 3.8 million women are making up almost half of the total work force, being either full time or part time employed [3]. More than one third of these women, i.e. 1.8 million are aged 45 years or older. Similar numbers are available from other countries as the United States, Canada and Sweden. For most women, employment has a beneficial effect on psychological wellbeing and mental health [4,5]. Unfortunately, however women in this age class have the highest annual decline in work ability [6]. In a previous study we found a significant negative correlation between menopausal symptoms and work ability in healthy working women [7]. A community-based study in Australia found that having any vasomotor symptoms was independently associated with impaired work ability [8]. In addition, recent studies report that menopause entail an increment in costs

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for employers through decreased work productivity and short-term sick leave as well as in healthcare costs [9–11].

Self-reported work ability is a concept widely used in occupational health, which can predict future impairment [6], long-term sickness absence [12–15], and labour force exit via disability benefits [16]. A longitudinal study with 12-months follow-up showed that 82% of office workers with a poor work ability score at baseline had more than 14 sick days in the next 12 months [15]. Therefore, in order to prevent future illness related work absenteeism, one should identify those women with low work ability. Currently, no studies are available that assessed the work ability in women with severe menopausal symptoms and quantified the impact of the severity of those symptoms on work ability.

The aim of this study was to evaluate the impact of severe menopausal symptoms on work ability in women who sought medical attention for their complaints, when compared to a group of age matched otherwise healthy women not diagnosed with menopausal symptoms.

## 2. Methods

### 2.1. Participants and procedures

Symptomatic women aged 44–60 years, who attended our outpatient menopause clinic for the first time between September 2009 and October 2012, were asked to participate in this cross-sectional study. These women received an invitation letter that outlined the nature and purpose of the study. Participants were notified that the provided data were to be used solely for research purposes.

Participants from an earlier study were used as the reference group. Full details of the methods of inclusion have been reported elsewhere [7]. Briefly, healthy working female employees aged 44–60 years working in a hospital or in home care service received an invitation by e-mail. They were asked to participate in a study that examined the association between menopausal symptoms and work ability. A link to a Web-based survey was included in this invitation. Given their age, these women may experience menopausal symptoms, but were not diagnosed as having menopausal complaints.

Inclusion criteria for the study were, apart from age, not having received any medical treatment for their menopausal symptoms. Women returning the Work Ability Index questionnaire incompletely or who reported being currently unemployed were excluded from the analysis.

In both studies women were notified through the invitation letter that filling out the questionnaires was considered as informed consent. Observational research using non-burdensome questionnaire data does not fall within the scope of the Dutch Act on Research Involving Human Subjects and does not need the approval of a research ethics committee.

### 2.2. Measures

Menopausal symptoms were measured using the Greene Climacteric Scale (GCS) [17]. This self-reported questionnaire is a 21-item validated instrument, divided into 5 domains, psychological (11 symptoms), subdivided into anxiety (6 symptoms) and depression (5 symptoms); somatic (7 symptoms); vasomotor (2 symptoms); and sexual (1 symptom). Responses are scored as follows: 0, not existing; 1, sometimes (symptom exists but is not bothersome); 2, often (bothersome during daily activities); and 3, very often (interfering with daily activities). The total GCS score ranges from 0 to 63 points.

Work ability was assessed using the Work Ability Index (WAI), developed by the Finnish Institute of Occupational Health [18]. The WAI is a self-reported questionnaire which assesses how well a worker is able to perform his or her work regarding the physical and mental work demands. This questionnaire is widely used in clinical occupational health and research; validity and test-retest reliability have been attained [19–21]. The score is determined through the answers to a series of questions, taking into consideration physical and mental work demands as well as a worker's health status and resources. The WAI covers seven dimensions, each of which is evaluated by one or more questions. The items include current work ability compared with best of lifetime, work ability in relation to job demands, number of current diseases diagnosed by a physician, estimated work impairment due to disease, illness related absenteeism during the past 12 months, a woman's own assessment of her future work ability during the upcoming 2 years, as well as mental resources (refers to the worker's life in general, both at work and during leisure-time). The total score varies between 7 and 49 points, and is divided into the following categories: poor work ability (score 7–27 points), moderate work ability (score 28–36 points), good work ability (score 37–43 points), and excellent work ability (score 44–49 points). Poor work ability and moderate work ability are together referred to as low work ability (score <37 points).

Information about individual characteristics and lifestyle factors was also collected using a self-reported questionnaire. Height was asked in meters and weight in kilograms and subsequently body mass index (BMI i.e. kg/m<sup>2</sup>) was calculated using the formula weight divided by squared height. Subjects were classified as current, previous or non-smokers. The frequency of participation in sports during leisure time was categorized into (almost) none, <3 times a week, 3–7 times a week. Education was assessed by highest education level attained and classified into low (primary education or lower vocational education), intermediate (secondary education or intermediate vocational education), and high (higher vocational education or university).

### 2.3. Statistical analysis

The normality of data was determined using the Kolmogorov-Smirnov test and the Shapiro-Wilk test. Frequency counts and percentages are presented for categorical variables, numerical data are presented as means with standard deviations (SDs) in case the data were normally distributed or as medians with interquartile ranges (IQRs) in case of a non-parametric distribution. Differences between groups were assessed using a  $\chi$ -squared test for categorical data, and an unpaired *t*-test or a Mann-Whitney *U* test for continuous variables.

To evaluate whether our reference group was a good representative sample and comparable to the general Dutch population, data from our group, regarding menopausal symptoms, were compared to a sample representative for the Dutch population [22]. Furthermore, regarding work ability, to a larger sample derived from a study with Dutch health care workers [23] as well as to the Dutch national database [24].

To examine the impact of the severity of menopausal symptoms on work ability, we used a multivariable logistic regression model. For this procedure, the crude score of the WAI was transformed to a dichotomous variable using 37 as a cut-off point to divide the categories into "poor-moderate i.e. low" and "good-excellent" groups. We calculated adjusted odds ratios (ORs) with corresponding 95% confidence intervals (95% CI), adjusting for age, level of education, smoking habits, participation in sports during leisure time and BMI. Missing values of single GCS-items were predicted using multiple imputation: five imputed data sets were created based on the relations between covariates in the study. The percentages of missing values within the population for analysis were 13%.

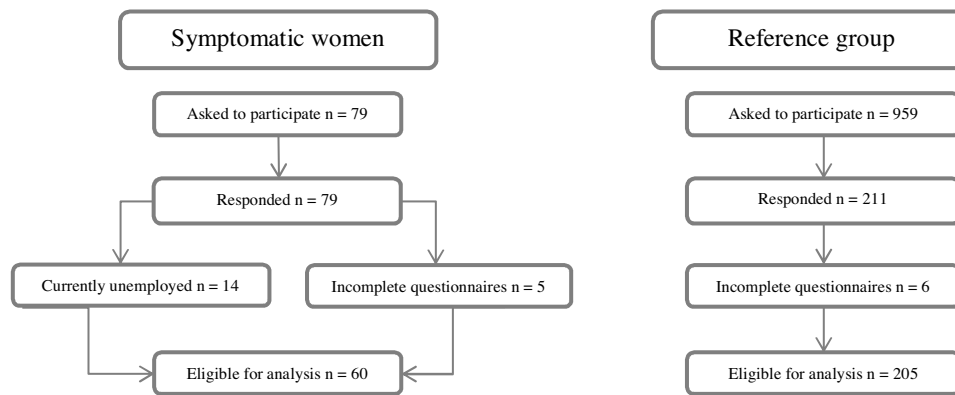


Fig. 1. Flowchart of women participating in this study.

**Table 1**  
Characteristics of symptomatic women and women in the reference group.

	Symptomatic women n = 60		Reference group n = 205		$\chi^2$	U	t	P
Age, years, mean – SD	51.5	4.0	51.2	4.0			0.5	0.592
Highest level of education, n-%					3.8			0.147
Low	6	10.0	11	5.4				
Intermediate	37	61.7	111	54.1				
High	17	28.3	83	40.5				
Smoking habits, n-%					0.3			0.848
Non-smoker	25	41.7	79	38.5				
Previous smoker	25	41.7	94	45.9				
Current smoker	10	16.7	32	15.6				
Participation in sports, n-%					2.0			0.368
(Almost) none	13	21.7	62	30.2				
<3 times a week	35	58.3	112	54.6				
3–7 times a week	12	20.0	31	15.1				
BMI, median – IQR	25.7	22.6	28.6	24.3	27.1	6850.5		0.180

Abbreviations: BMI, body mass index, SD, standard deviation; IQR, interquartile range; n, number of women. Differences in baseline characteristics were tested using Student *t*-, Mann-Whitney U and Chi-square tests.

Analyses were performed using SPSS (Statistical Package for the Social Sciences, Armonk, NY: IBM Corp) Version 20.0.

### 3. Results

A total of 79 first time attendees of our outpatient menopause clinic were asked to participate in this study, all were willing to fill out the questionnaires. Eighteen percent of these symptomatic women were excluded as they were currently unemployed ( $n = 14$ ), 5 of the remaining women were excluded because of incomplete WAI data. A total of 60 symptomatic women were eligible for analysis. Over nine hundred ( $n = 959$ ) healthy working women were invited to participate in our study. Of those invited to participate, 211 (22%) replied to the email invitation and filled out the questionnaire. Six women were excluded from analysis because of incomplete WAI data, leaving 205 women who were included in the reference group (Fig. 1).

Table 1 depicts the characteristics of both the symptomatic ( $n = 60$ ) and reference group ( $n = 205$ ). No significant differences in age, level of education, smoking habits, participation in sports during leisure time or BMI were found between these two groups. The majority of symptomatic women were employed in healthcare (31.7%), administration (13.3%) and education (18.3%).

Barentsen et al. (2001) describe a general Dutch population sample of 504 women aged 45–65 year, classified according to their menopausal status [22]. The GCS-scores for peri- and postmenopausal women are in good agreement with the results in our reference group. Regarding work ability, subjects in our reference group reported an average 1.5 points lower work ability index score compared to the Dutch national database, which contains

WAI scores from women in various professions [24]. Compared to women having a similar profession, the reference subjects in our study reported much the same work ability scores [23].

In all five GCS domains, symptomatic women reported significant more often menopausal symptoms compared to the reference subjects ( $P < 0.01$  for all comparisons). The mean total GCS scores for symptomatic women and women from the reference group were 26.7 (SD = 8.7) and 14.2 (SD = 7.6) respectively,  $P < 0.001$  (Table 2). Overall, symptomatic women (WAI = 32.0, IQR = 26.0–36.5) reported lower work ability compared to the reference subjects (WAI = 40.0, IQR = 35.0–40.0;  $P < 0.001$ ). Over twenty-eight percent of women in the symptomatic group reported poor work ability ( $n = 17$ ), 45% ( $n = 27$ ) experienced moderate work ability, together representing over seventy-five percent of all symptomatic women. In contrast, close to seventy percent of women in the reference group, without diagnosis of menopausal symptoms, reported good-excellent work ability,  $P < 0.001$ .

The multivariable logistic regression analysis (Table 3) showed that, after adjustment for age, level of education, participation in sports during leisure time, smoking habits and BMI, women visiting an outpatient clinic for menopausal symptoms were significantly more likely to report low work ability than their healthy counterparts (OR 8.4, 95% CI 4.1–17.2).

### 4. Discussion

First time attendees of an outpatient menopause clinic report significantly more menopausal symptoms and lower work ability compared to women without diagnosis of menopausal complaints. As expected they experience more and severe menopausal

**Table 2**  
Greene climacteric Scale and Work Ability Index outcomes and differences between symptomatic women and women in the reference group.

	Symptomatic women n = 60			Reference group n = 205			$\chi^2$	U	t	P
Greene Climacteric Scale <sup>a</sup>										
Anxiety Score	7	6	9.8	4	2	5		10544		<0.001
Depression Score	6	4	8	3	2	5		9570		<0.001
Psychological Score	13.5	10	18	7	4	10		10442.5		<0.001
Somatic Score	7	4	10.8	3	2	6		9137.5		<0.001
Vasomotor Score	4	2	6	2	1	3		9409.5		<0.001
Sexual dysfunction Score	1	1	2	1	0	1		7473		0.007
Total GCS Score, mean – SD	26.7		8.7	14.2		7.6			10.8	<0.001
Work Ability Index										
1. Current work ability relative to lifetime best (0–10)	7	5	7	8	7	9		2675.5		<0.001
2. Work ability in relation to demands at work (2–10)	6.5	6	8	8	7.5	8		2909.5		<0.001
3. Current diseases diagnosed by physician (1–7)	3	1	4	4	2.5	5		3917		<0.001
4. Work impairment due to diseases (1–6)	4	2	5	6	4	6		3385.5		<0.001
5. Sick leave in past year (1–5)	4	2	5	5	4	5		3803.5		<0.001
6. Prognosis of work ability 2 years from now (1–7)	7	4	7	7	7	7		5148		0.004
7. Mental resources (1–4)	3	2	3	3	3	4		3630.5		<0.001
Total WAI Score	32.0	26.0	36.5	40.0	35.0	44.0		2380		<0.001
WAI in categories, n-%							54.1			<0.001
Poor work ability	17		28.3	7		3.4				
Moderate work ability	27		45.0	54		26.3				
Good work ability	14		23.3	86		42.0				
Excellent work ability	2		3.3	5		28.3				

Abbreviations: WAI, Work Ability Index; SD, standard deviation; n, number of women.

Data are given as median–interquartile range unless otherwise indicated.

Differences in outcomes were tested using Student *t*-, Mann-Whitney U and Chi-square tests.

<sup>a</sup> The number of missings were 0.8% (n = 2) for anxiety score, 11.3% (n = 30) for depression score, 11.3% (n = 30) for psychological score, 1.5% (n = 4) for somatic score, 0.8% (n = 2) for vasomotor score and 1.1% (n = 3) for sexual dysfunction score.

**Table 3**  
Multivariable logistic regression analysis for the association between symptomatic women and women in the reference group with low work ability (WAI < 37).

	OR	95% CI		P
		Lower	Upper	
Participant				<0.001
Symptomatic women	8.4	4.1	17.2	
Reference group (ref)	1			
Age	1.1	1.0	1.2	0.054
Highest level of education				0.291
Low	1.3	0.4	4.4	
Intermediate	1.6	0.9	3.0	
High (ref)	1			
Smoking habits				0.094
Non-smoker (ref)	1			
Previous smoker	1.0	0.5	1.8	
Current smoker	0.4	0.2	1.0	
Participation in sports				0.527
(Almost) none	1.6	0.6	4.2	
<3 times a week	1.2	0.5	2.7	
3–7 times a week (ref)	1			
BMI	1.1	1.1	1.2	0.001

Abbreviations: OR, odds ratio; CI, confidence interval; ref, reference variable; BMI, body mass index.

symptoms. The finding that they have significantly lower work ability is an important outcome in terms of women's health and social and psychological wellbeing.

This study found that the odds for reporting low work ability are eight times greater for women suffering from menopausal complaints compared to women not experiencing such discomfort. This reinforces the results of previous studies that indicated a negative impact of menopausal symptoms on a woman's capacity to fully function at a normal level at work [2,7,8,25]. Griffiths and colleagues found that the menopausal symptoms poor concentration, tiredness, poor memory, feeling low/depressed and lowered confidence were most commonly viewed as problematic for work [2]. A recent study conducted by Gartoulla and colleagues found that having any vasomotor symptoms was suggested to be strongly and independently associated with impaired work ability [8].

In several studies, the WAI showed to predict future illness related absenteeism among women with lower work ability scores. A low work ability index score predicted long-term absenteeism. This relationship remained significant after adjustment for work-related factors, family structure, lifestyle, living condition and behavioural characteristics [12,13]. Furthermore a low work ability index score showed to be highly predictive for receiving a disability pension within two years from the baseline assessment [16]. These data together with the present study indicate that over three quarters of the women who seek help for their menopausal symptoms might be at risk for developing future illness related absenteeism from work that might lead to discontinuation of active participation in labour.

Despite the uniqueness of this study, it has some limitations. The cross-sectional design does not allow causal inferences to be made, and there could be unmeasured confounders that may explain some of the observed differences in WAI score between the groups. Another limitation is the response level of the reference group, which was rather low. Since we have no information about the non-responders concerning their menopausal complaints, the reason for not responding is unclear and this might be related to these complaints. It is possible that women, who found menopausal transition problematic, were more willing to respond. This might lead to an overestimation of the risk associated with the menopausal transition. On the contrary, women experiencing more distress during their menopausal transition that might impact on their work ability are less likely to disclose their problems to co-workers or managers [26]. Despite the fact that individual results of the survey would not be disclosed to the employers and the survey could be answered anonymously, women may have refused to participate in this study for fear of stigmatization or being perceived as at risk for future illness related absenteeism. In the latter case the real impact of menopausal complaints on work ability might be underestimated. To get some more insight in the impact of these confounders we compared our reference group with a larger sample derived from a study with Dutch healthcare workers [23] as well as to the Dutch national database [24], to evaluate whether our group was a good representative sample and comparable to the



general Dutch population. As mentioned, reference subjects in our study had an average 1.5 points lower work ability index score compared to women in various professions, yet comparable work ability scores to women having a similar profession. Women working in healthcare and social services, which is a physically challenging occupation, generally have lower work ability [6]. Hence, it is much more likely that the current study might underestimate the impact of severe menopausal symptoms on work ability. Furthermore, the subjects in the symptomatic group were first-time attendees of an outpatient menopause clinic. In The Netherlands, a referral from a GP is mandatory to enter an outpatient menopause clinic. These women probably constitute already a preselected group of subjects with severe menopausal symptoms, as referring to a specialist healthcare professional with menopausal expertise in was necessary. This in turn could have led to an overestimation of the effect. However, the aim of this study was not to determine prevalence of symptoms in a representative sample of working women, but rather to reaffirm the negative impact of menopausal symptoms on a woman's ability to continue her current work at an acceptable level. The practical implications of this study are in line with the recently published NICE guideline on menopause, which aims to improve knowledge among GP's and other healthcare professionals about the impact menopause might have on a woman's well-being [27]. This guideline addresses the possible reluctance of GP's to prescribe HRT because of overestimation of the risks and contraindications along with an underestimation of the benefits HRT might have. This is generally due to the fact that a lot of healthcare professionals are neglecting the impact of menopausal symptoms on a woman's quality of life. This could particularly be true for Dutch GP's, who emphasize considerable restraints in their own guideline in prescribing HRT. In their guideline they state that referral to a menopause specialist is not indicated for management of symptoms, questions or problems regarding the menopausal transition and the following post-menopausal years [28]. In addition, information should be given about non-pharmaceutical therapies such as cognitive behavioural therapy [29]. Furthermore, employers should also play an important role in coping with menopause in the workplace. Recently several recommendations for adjusting working conditions, carrying out positive attitudes towards the issue and offering guidance on how to deal with menopause have been formulated [30–32]. Since menopause could have such an impact on work ability, it is expected that treatment of its symptoms also might lead to an improvement in work ability. However, this will have to be confirmed by future research.

In conclusion, symptomatic women visiting a menopausal clinic for their symptoms have lower work ability compared to their healthy age matched counterparts not diagnosed with menopausal complaints. Over three quarters report significantly lower work ability and might be at risk for developing future illness related absenteeism. Offering appropriate treatment and education to these women could enable them to maintain their important role in today's workforce and increase their quality of life considerably. Future research should focus on treatment of menopausal symptoms and their impact on work ability, from an employer as well as a healthcare professional perspective.

### Contributors

M.G. participated in the development of the study, collection, analysis and interpretation of data and writing of the manuscript.

M.P.v.A. participated in the development of the study and editing of the manuscript.

S.J.R. participated in the analysis and interpretation of data and editing of the manuscript.

J.S.E.L. participated in the editing of the manuscript.

H.O. participated in the development of the study, collection of data, and writing and editing of the manuscript.

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

### Conflict of interest

The authors declare no conflict of interest.

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### Ethical approval

Observational research using non-burden some questionnaire data does not fall within the scope of the Dutch Act on Research Involving Human Subjects and does not need the approval of a research ethics committee.

### Provenance and peer review

This article has undergone peer review.

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