Journal Pre-proof

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PII: S0378-5122(21)00265-6
DOI: https://doi.org/10.1016/j.maturitas.2021.09.003
Reference: MAT 7542

To appear in: *Maturitas*

Received date: 31 May 2021
Revised date: 15 July 2021
Accepted date: 2 September 2021

Please cite this article as: Maija Lipasti , Jaana Jalava-Broman , Lauri Sillanmäki , Juha Mäkinen , Päivi Rautava , Climacteric symptoms more severe in 2010 than in 2000 – experience of Finnish women aged 52-56 years not now or previously on menopausal hormone therapy, *Maturitas* (2021), doi: https://doi.org/10.1016/j.maturitas.2021.09.003

Climacteric symptoms more severe in 2010 than in 2000 – experience of Finnish women aged 52-56 years not now or previously on menopausal hormone therapy

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Highlights

- Little is known about the cohort effect on the experience of climacteric symptoms.
- The present study reveals that women aged 52–56 years not now or previously on menopausal hormone therapy experienced more severe climacteric symptoms in 2010 than had a similarly aged cohort in 2000.
- We did not find any significant associations between sociodemographic or health background and climacteric symptoms.

Abstract

Objectives: To analyse and compare the experience of climacteric symptoms and their associations with sociodemographic and health-related characteristics in two cohorts of Finnish women aged 52–56 years, born ten years apart and not now or previously on menopausal hormone therapy (MHT).
Study design: Nationwide population-based time-trend study with a large number of participants (n = 1986 + 1988).
Main outcome measures: The experience of climacteric symptoms was assessed by 12 commonly used menopause-related symptoms.
Results: Women aged 52–56 experienced more moderate or severe symptoms and fewer mild symptoms in 2010 than in 2000. Being unemployed or inactive was associated with more severe symptoms (*P = 0.007*), but employment status had no effect on the relative odds estimates.
Conclusions: The influence of the birth cohort and time-period effects as well as work-related factors on the experience of climacteric symptoms in women not now or previously on MHT needs further research, particularly since the change in the experience of symptoms found in this study occurred within only ten years.

Keywords
Climacteric symptoms; Menopausal, Finnish women; Health promotion; Time-trend; Cohort effect

1. Introduction

The intensity and prevalence of climacteric symptoms at different stages of menopause have been examined in several epidemiological and healthcare studies [1-4]. Most menopausal women have climacteric symptoms, such as sweating and hot flushes or sleeping problems, but some women experience only mild symptoms, whereas others experience moderate or severe symptoms [1,4-6]. There is still limited knowledge on whether the experience of climacteric symptoms differs across birth cohorts, i.e., if the experience of climacteric symptoms differs between generations of women. Only little is known about why women with similar backgrounds experience climacteric symptoms differently.

Climacteric symptoms impair the quality of life and well-being of women [7-9]. Typically, women find that climacteric symptoms interfere with their daily activities [9,10]. Nearly half of employed climacteric women have some degree of difficulty in coping with climacteric symptoms [11,12]. Especially depression and sleeping problems, but also irritability and hot flushes reduce work ability, job satisfaction and work engagement [12,13]. Healthcare professionals can increase women's understanding about climacteric symptoms and support and promote their well-being and ability to cope with menopause [14].

During the past decades, there have been rapid changes both in work life and in society in general [15,16]. Such changes have generated an interest in comparing how climacteric symptoms are experienced by women of similar age at two different points of time. The purpose of this study was to analyse and compare the experience of climacteric symptoms and their associations with selected sociodemographic and health-related characteristics in two cohorts of Finnish women not now or previously on menopausal hormone therapy (MHT) aged 52–56 years, born ten years apart. The study provides new information for health promotion practices.

2. Methods

Study subjects

The nation-wide randomised *Health and Social Support in Finland study* (HeSSup Study), launched in 1998, was continued in 2000 and 2010 with an additional study, entitled *Quality of Life among Middle-aged Women* (QoL Study) [1,17].

QoL questionnaires were mailed in 2000 and 2010 to all women in two baseline cohorts of the HeSSup Study (i.e., birth cohorts 1944–1948 and 1954–1958) who had responded to the HeSSup survey in 1998. All women aged 52–56 years who had returned their HeSSup questionnaires in 1998 and their QoL questionnaires in 2000 and 2010 were included in the present study.

In 2000, a total of 1986 women and in 2010 a total of 1988 women aged 52–56 years participated. The response rate of the surveyed two study groups was 73% in 2000 and the same, 73% in 2010%.

The experience of climacteric symptoms and their association with sociodemographic background information and health information were examined in a situation where women did not receive or had not received any treatment for their symptoms.

Study variables

The QoL Study questionnaire contained questions regarding the respondents' gynaecological history, climacteric symptoms, treatment of climacteric symptoms and sexuality. The experience of climacteric symptoms in women not now or previously on MHT was assessed by questions based on the classifications presented by Stadberg et al. [18] and Kupperman et al. [19]. Accordingly, the climacteric symptoms were divided into 12 potentially menopause-related symptoms: sweating, hot flushes, vaginal dryness and tenderness, recurrent urinary infections, urinary incontinence, sleeping problems, depression, irritability, dizziness, palpitation, dyspareunia and lack of sexual desire. The respondents were asked to rate the intensity of symptoms on a scale of 1 to 10, where 1 represented "not at all" and 10 represented "very severe", as they experienced them before they had received any treatment for their symptoms.

The sociodemographic background information of the respondents included marital status, place of residence, basic education, professional education and employment status, and the health information included body mass index (BMI), metabolic equivalent (MET) and smoking status. This data was collected from the HeSSup study data. BMI was calculated from self-reported weight and height as kg/m2, while MET was determined from the self-reported estimate of the amount of physical activity during leisure and commuting time as MET-hours/day.

Statistical analyses

The non-response bias was tested by comparing respondents who responded to both QoL surveys, the 2000 survey and the 2010 survey, with those who responded only to the 2000 survey with regard to the following sociodemographic information: marital status, place of residence, basic education, professional education and employment status. For the non-response analysis, Pearson's χ^2 -test was used.

The respondents in both study groups were classified into three groups according to menopausal status: 1) regular premenopausal period, when the respondents still had natural and regular menstruation, 2) irregular premenopausal period, when menstruation was irregular and 3) postmenopausal, when menstruation had ceased spontaneously more than one year previously or after hysterectomy and bilateral salpingo-oophorectomy. Respondents whose menopausal status was uncertain were classified as "not classified".

To analyse and compare the intensity of four typical symptoms associated with reduced estrogen production (sweating, hot flushes, vaginal dryness and sleeping problems) in women not now or previously on MHT between the two study groups, a sum score was formed from the four symptoms. The sum score ranged from 2 to 40, with 2–4 meaning "no symptoms", 5–16 meaning "mild symptoms", 17–28 meaning "moderate symptoms" and 29–40 meaning "severe symptoms".

A cumulative logistic regression model was used to analyse the associations between the sociodemographic background information on marital status, place of residence, basic education, professional education and employment status and the experience of climacteric symptoms among women aged 52–56 years in 2000 compared with women aged 52–56 years

in 2010. The same method was used to analyse the associations between the health-related variables (BMI, MET and smoking status) and the experience of climacteric symptoms.

Multinomial and binary logistic regression analysis was used to calculate the statistical significance of the difference between the two study groups with regard to experiencing these five common climacteric symptoms in women not now or previously on MHT: sweating, hot flushes, sleeping problems, lack of sexual desire and depression.

The dependence between variables was tested with Pearson's χ^2-test. Odds ratios (ORs) and 95% confidence intervals (CIs) were used to assess the strength of associations.

The statistical analyses were performed using SAS software (SAS 9.4 TS1M1 2012, SAS Institute Inc., Cary, NC, USA).

Ethics

The study was conducted in accordance with generally accepted guidelines for good scientific practice in Finland [20].

3. Results

As regards women aged 52–56 years in 2000 (i.e., the birth cohort 1944–1948) the ratio of responding to both surveys (the 2000 survey and the 2010 survey), compared to responding only the 2000 survey was higher among women with higher professional education ($P < 0.001$), women with higher basic education ($P = 0.012$) and women with higher participation in the labour market ($P < 0.001$). Regarding women aged 52–56 years in 2010 (i.e., the birth cohort 1954–1958), response ratio to both surveys was higher among women with higher participation in the labour market ($P < 0.001$) and women with partnership ($P = 0.004$) (Table 1).

In the 2000 survey, 12% of the respondents had their regular premenopausal period at the time of response, 8% had their irregular premenopausal period and 52% were postmenopausal. In the 2010 survey the corresponding rates were 8%, 11% and 50% (Table 1).

Fig. 1 illustrates the intensity of four typical symptoms associated with a decrease in estrogen production (sweating, hot flushes, vaginal dryness, and sleeping problems) among Finnish women not now or previously on MHT aged 52–56 in 2000 and 2010. The intensity of the symptoms was expressed as “no symptoms”, “mild symptoms”, “moderate symptoms” and “severe symptoms”. Finnish women aged 52–56 years experienced (measured as categorized symptom intensity score, %) fewer mild symptoms and more moderate or severe symptoms in 2010 than in 2000 (Fig. 1). Furthermore, in 2010 women aged 52–56 years had 1.7-fold odds for experiencing moderate symptoms and 1.8-fold odds for experiencing severe symptoms compared to women of same age ten years previously (Table 2).

Fig. 2 illustrates the prevalence of five common climacteric symptoms (sweating, hot flushes, sleeping problems, lack of sexual desire and depression) experienced by women not now or previously on MHT aged 52–56 years in 2000 and 2010. The prevalence of “no symptoms”, “mild symptoms”, “moderate symptoms” and “severe symptoms” are shown. There were differences between the study groups in experiencing five common climacteric symptoms, especially sleeping problems: the prevalence of sleeping problems had increased by 5–7% in ten years (Fig. 2). Binary logistic regression analysis showed that the odds of experiencing overall sleeping problems were 1.5 times higher (OR 1.53) in 2010 than for women of the

same age ten years previously, and the odds for severe sleeping problems were 1.3 times higher odds (OR 1.34) (Table 2).

When a cumulative logistic regression model was used to examine associations between, on the other hand, selected sociodemographic background factors (marital status, place of residence, basic education, professional education and employment status), and, on the other hand, health behaviour determinants (BMI, MET and smoking status), and four typical symptoms associated with a decrease in estrogen production (sweating, hot flushes, vaginal dryness and sleeping problems) among women aged 52–56 years in 2000 compared with women on the same age ten years later, we found some statistically significant associations: being unemployed or outside the labour market was associated with more severe symptoms (*P = 0.007*) than being employed. However, the employment status did not increase the relative odds between the study groups. (Table 3.)

There were no statistically significant differences between the study groups regarding the associations between the health behaviour determinants, BMI, MET and smoking status, and the four typical symptoms associated with a decrease in estrogen production (Table 3).

When comparing and analysing the experiences of climacteric symptoms between the study groups, we found that there were differences between the groups: Finnish women not now or previously on MHT aged 52–56 years experienced climacteric symptoms more severe in 2010 than in 2000 and had more sleeping problems.

4. Discussion

Although it is known that the level of education, place of residence, smoking and obesity, among other variables, are associated with climacteric symptoms [2,21,22], there has been only little research on the differences in how women of the same age but of different birth cohorts experience climacteric symptoms. To fill this gap, we firstly compared the intensity and prevalence of climacteric symptoms, and secondly analysed the associations between climacteric symptoms and sociodemographic characteristics and between climacteric symptoms and health-related characteristics, in two cohorts of Finnish women not now or previously on MHT aged 52–56 years but born ten years apart (birth cohorts 1944–1948 and 1954–1958).

In the present study we did not find any significant associations between sociodemographic or health information and climacteric symptoms, but employment status may have been related to how climacteric symptoms were experienced. The results raised questions about whether changes in society might be associated to the intensity or prevalence of climacteric symptoms. Moreover, publishing the results of the Women's Health Initiative (WHI) trial in 2002, which showed the risks of the MHT [23], may have led to a decision to avoid MHT. Still, in the present study we examined the experience of climacteric symptoms and their associations with background data in a situation where women did not receive or had not received any treatment for their symptoms.

Experience of climacteric symptoms interferes with a women's quality of life or well-being [3,24,25]. Still, the experience is always subjective. Therefore, the situation of each woman should be viewed from her own experience and background.

Good sleep quality is a prerequisite for personal well-being and health [26]. Sleeping problems such as difficulties falling asleep, intermittent sleep, and waking up too early reduce the quality of sleep and cause daytime fatigue, impaired performance, and irritability [7,27]. Examining the quality of sleep, identifying potential sleeping problems and, if necessary, guiding sleep behaviour are important elements in promoting the health of the middle-aged women.

Our results can be used for designing, implementing, and evaluating health services, especially health counselling and patient education, in the public as well as the private health sector. The results are useful for healthcare professionals particularly in primary health care and occupational health care, since increasing the understanding of climacteric symptoms among middle-aged women will improve their holistic care. It is important that healthcare professionals take into consideration the woman's own perception of her symptoms and guide and encourage her to seek help if she perceives the symptoms as significantly affecting her quality of life.

The strengths of the present study include a nationwide population-based design, a relatively large number of respondents in both study groups and a questionnaire structured specifically to assess women's experience of various types of climacteric symptoms. The questionnaires were sent in both QoL surveys to the entire original birth cohorts which reduced selection bias. Drop-outs were carefully analysed.

The study limitations include a low response rate at the beginning of the HeSSup Study, responder bias and the possibility of recall bias related to retrospective, self-reported outcomes. Yet, according to a comprehensive analysis of the HeSSup Study 1998 data, the differences between the respondents and the corresponding Finnish population were relatively small as far as health-related characteristics are concerned [17].

Further research is needed to continue to determine the changes in climacteric symptoms in women not now or previously on MHT among women in a certain birth cohort. Likewise, more research is needed to determine the influence of the period effects on experiencing climacteric symptoms, as well as to assess the associations between work-related factors and climacteric symptoms. It would also be interesting to know how Finnish women aged 52–56 years experienced climacteric symptoms in 2020.

Contributors

Maija Lipasti was involved in the conception and design of the study and in data collection, prepared the first draft, its revised version and finalised the manuscript based on comments from all authors.

Jaana Jalava-Broman was involved in the conception and design of the study and in data collection.

Lauri Sillanmäki was involved in the conception and design of the study, in data collection and in statistical analysis.

Juha Mäkinen was involved in the conception and design of the study, in data collection and in supervising the research project.

Päivi Rautava was involved in the conception and design of the study, in data collection and in supervising the research project.

All authors were involved in drafting and critically revising the manuscript for intellectual content and saw and approved the final submitted version.

Declaration of competing interests

The authors declare that they have no competing interests.

Funding

No funding was received for this study.

Ethical approval

The study was performed according to the principles of the revised declaration of Helsinki and approved by the Ethics Committee of the Hospital District of Southwest Finland.

Provenance and peer review

This article was not commissioned and was externally peer reviewed.

Research data (data sharing and collaboration)

There are no linked research data sets for this paper. Adhering to 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.

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Table 1

Results of non-response analysis[a] and distribution of menopausal status of participants in 2000 (n = 1986) and 2010 (n = 1988) in the Finnish nationwide HeSSup and QoL cohort studies for women aged 52–56 years

	Women aged 52–56 years in 2000		Women aged 52–56 years in 2010	
	%	*P*[b]	%	*P*[b]
Non-response analysis				
Marital status		0.46		0.004
No relationship	21		17	
Relationship	79		83	
Place of residence		0.53		0.17
Town	63		61	
Local authority area	16		18	
Countryside	21		21	
Basic education		0.012		0.26
Less than 9 years	47		27	
9 years	25		29	
More than 9 years	28		44	
Professional education		<0.001		0.34
No professional education	18		9	
Vocational course or school/Apprenticeship contract	35		31	
College	31		43	
University	16		17	
Employment status		<0.001		<0.001
Full-time/Part-time worker or student	85		87	
Unemployed/Laid off	8		9	
Retired	5		1	
Housewife	2		3	
Menopausal status				
Regular premenopausal period	12		8	
Irregular premenopausal period	8		11	
Postmenopausal	52		50	
Not classified	28		31	

[a] Respondents to both the 2000 survey and to the 2010 survey compared to those who responded only to the 2000 survey

[b] Pearson's χ^2 -test

Table 2

Experience of climacteric symptoms among Finnish women not now or previously on MHT aged 52–56 in 2000 (n = 1986) and 2010 (n = 1988) according to the Finnish nationwide HeSSup and QoL cohort studies; comparison

	2000	2010	OR[a]	95% CI[a]
Intensity				
Mild symptoms (%)	48	40	1.23	0.89–1.71
Moderate symptoms (%)	35	42	1.74	1.26–2.60
Severe symptoms (%)	12	14	1.81	1.25–2.42
Prevalence				
Sweating (%)	86	88	1.12	0.93–1.36
Hot flushes (%)	81	83	1.11	0.94–1.31
Sleeping problems (%)	75	82	1.53	1.30–1.79
Lack of sexual desire (%)	70	72	1.10	0.95–1.27
Depression (%)	67	65	0.93	0.81–1.06
Prevalence of severe symptoms				
Sweating (%)	26	27	1.04	0.90–1.21
Hot flushes (%)	25	26	1.07	0.92–1.23
Sleeping problems (%)	21	26	1.34	1.15–1.56
Lack of sexual desire (%)	14	17	1.18	0.99–1.41
Depression (%)	12	11	0.97	0.79–1.18

[a] Logistic regression analysis

Table 3

Associations between sociodemographic and health-related characteristics and the intensity of climacteric symptoms among women not now or previously on MHT aged 52–56 years in 2000 (n = 1986) compared with among women aged 52–56 years in 2010 (n = 1988) according to the Finnish nationwide HeSSup and QoL cohort studies

	P-value[a]	OR[a]	95% CI[a]
Sociodemographic characteristics and the intensity of climacteric symptoms			
Marital status (no relationship vs. relationship)	0.023	1.424	1.244–1.634
Place of residence (town vs. countryside)	0.390	1.420	1.247–1.618
Basic education (< 9 years vs. ≥ 9 years)	0.048	1.468	1.284–1.678
Professional education (vocational course or school vs. college or higher)	0.034	1.468	1.284–.,681
Employment status (unemployed/laid off vs. employed/student)	0.007	1.422	1.242–1.626
Health-related characteristics and the intensity of climacteric symptoms			
BMI (≥ 25 kg/m2 vs. < 25)	0.236	1.387	1.205–1,595
MET (< 2 vs. ≥ 2 MET-hours/day)	0.029	1.377	1.198–1,585
Smoking (yes vs. no)	0.124	1.399	1.214–1.613

[a] Cumulative logistic regression main effects model with time as another predictor

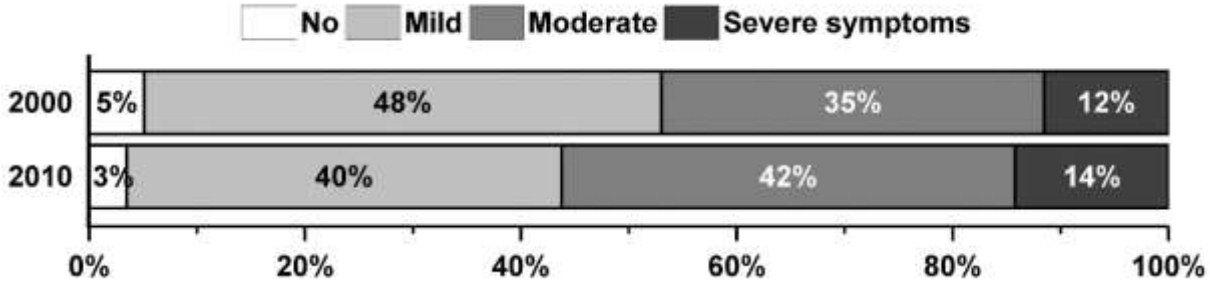

Fig. 1. Intensity (%) of the symptom score on four typical symptoms associated with a decrease in estrogen production (sweating, hot flushes, vaginal dryness and sleeping problems) among women not now or previously on MHT aged 52–56 in 2000 and 2010.

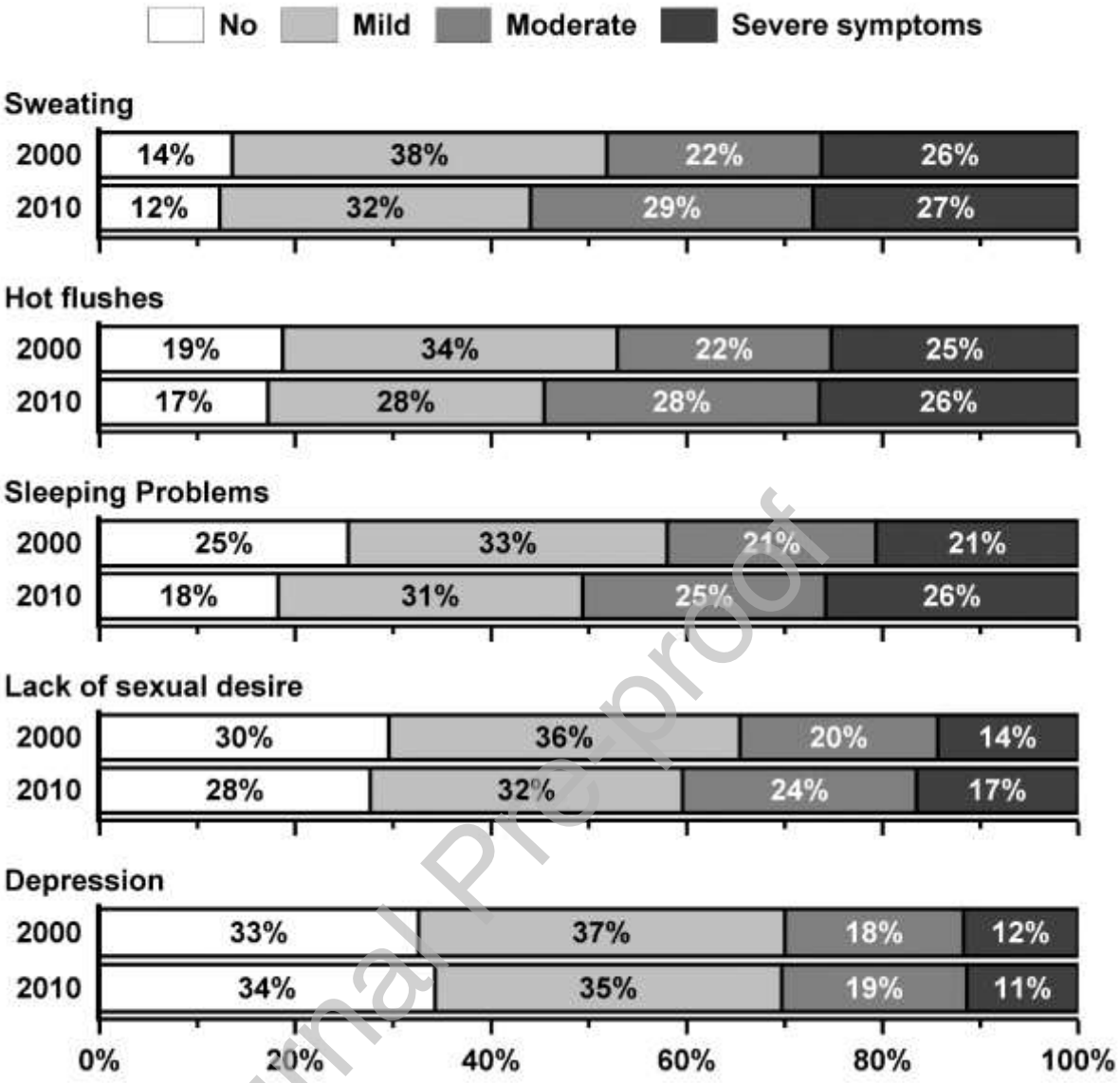

Fig. 2. Prevalence (%) of five common climacteric symptoms (sweating, hot flushes, sleeping problems, lack of sexual desire and depression) among women not now or previously on MHT aged 52–56 in 2000 and 2010.

Contribution statement

Maija Lipasti was involved in the conception and design of the study and in data collection. She prepared the first draft, its revised version and finalised the manuscript based on comments from all authors.

Jaana Jalava-Broman was involved in the conception and design of the study and in data collection.

Lauri Sillanmäki was involved in the conception and design of the study, in data collection and in statistical analysis.

Juha Mäkinen was involved in the conception and design of the study, in data collection and in supervising the research project.

Päivi Rautava was involved in the conception and design of the study, in data collection and in supervising the research project.

All authors were involved in drafting and critically revising the manuscript for intellectual content and have seen and approved the final submitted version.

Conflict of interest

The authors declare that they have no conflict of interest.

Funding

No funding was received for this study.

Ethical approval

The study was performed according to the principles of the revised declaration of Helsinki and approved by the Ethics Committee of the Hospital District of Southwest Finland.

Research data (data sharing and collaboration)

There are no linked research data sets for this paper. Adhering to 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.