

## Prevalence and severity of menopausal symptoms in peri and post-menopausal women

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### Abstract

#### *Aim*

To explore prevalence and severity of menopausal symptoms in peri- and post-menopausal women.

#### *Methods*

Both peri- and post-menopausal women (>40 years) were included in this cross-sectional study and electronic questionnaires were sent to those who consented. Menopausal symptoms were assessed using the Menopause Rating Scale (MRS). Each question is assigned a score for symptom intensity that ranges from 0 (no symptoms) to 4 points (very severe symptoms) with a maximum score of 44.

#### *Results*

In total 308 women completed the questionnaires including 156 perimenopausal (mean age  $48.37 \pm 4.03$  years) and 152 postmenopausal women ( $54.31 \pm 4.47$  years). Overall, 53 (17%) participants were using menopausal hormonal therapy (MHT) with 32 (21%) perimenopausal women using MHT compared to 21 (14%) postmenopausal women. The prevalence and severity of menopausal symptoms in women not receiving MHT was assessed, and the total mean MRS score was  $15.17 \pm 6.79$  and  $10.76 \pm 7.77$  for peri and postmenopausal women respectively ( $p=0.003$ ). 214 (84%) of women reported experiencing hot flushes and sweating, 211 (83%) experienced sleep problems and 189 (74%) experienced sexual problems. 78 (31%) women had a total MRS score above 17, which is defined as severe. When considering menopausal stage, perimenopausal women were more likely to experience psychological issues compared to postmenopausal women whereas postmenopausal women were more likely to experience hot flushes and dryness of the vagina ( $p < 0.001$ ).

## *Discussion*

This study demonstrated a high prevalence of menopausal symptoms among women living in Ireland. A multidisciplinary approach is needed to manage these symptoms.

## **Introduction**

Menopause is a natural phenomenon occurring as women approach middle-age and marks the permanent cessation of menses, following a decline in ovarian function and a drop in circulating oestrogen.<sup>1</sup> The transition from pre- to peri- to post- menopause is accompanied by changes to circulating hormone levels, which can be symptomatic with potential impacts on quality of life.<sup>2</sup> Women frequently report a wide and diverse array of symptoms leading up to and post menopause.<sup>3</sup> The menopausal transition (MT), and the years following, are frequently symptomatic, with four main categories of symptoms including: vasomotor (e.g., hot flushes and night sweats), vaginal (e.g., atrophy), sleep disturbances (e.g., insomnia) and altered mood (e.g., depression and anxiety).<sup>3</sup> Research would indicate that more than 80% of women experience menopausal symptoms and this is unique to each woman. Many factors can influence menopause including diet, smoking, physical activity, ethnicity, physical activity, body mass index, socioeconomic status, and overall medical and gynaecologic health<sup>4</sup>.

Due to a growing aging population and longer life expectancies, Irish women will spend a significant portion of their lives in postmenopause. As such, the health issues including menopausal symptoms of both peri- and postmenopausal women have more recently received widespread attention from both the healthcare sector and wider public. Although there has been extensive menopausal symptom research conducted on women from high-income countries,<sup>5, 6</sup> there is limited research from an Irish perspective. This cross-sectional study was carried out to increase our understanding of this underexplored area.

## **Methods**

Cross-sectional methodology was used to collect information on menopausal status and symptoms alongside socio-demographic characteristics and lifestyle behaviours. Data were collected anonymously, and participants were advised that by completing the questionnaire they were giving consent for their data to be used for the present study. The study was conducted in accordance with the Declaration of Helsinki and received ethical approval from the Department of Sport and Health Sciences Research Ethics Committee at the Technological University of the Shannon. Participants were recruited via emails distributed in a variety of workplaces and via recruitment posts on social media platforms. Women also shared the link to the questionnaire with friends and family members through word of mouth. The questionnaire was electronically distributed to women over the age of 40 years who

categorised themselves as either perimenopausal or postmenopausal as defined on the basis of the STRAW +10 criteria.<sup>7</sup> Perimenopausal status included women experiencing irregular menses within the last 12 months or an absence of menstrual bleeding less than 12 months. Postmenopause defined as no menses for at least 12 months. Women who had a hysterectomy or oophorectomy were classified as surgical menopause and were excluded from the study. The research was carried out between January 2022 and March 2022.

Menopausal symptoms and severity were assessed using the 11-item Menopausal Rating Scale (MRS). The MRS is a validated self-reported subjective scale that assesses menopause symptoms.<sup>8</sup> It consists of 11 symptoms that can be categorised into three subscales: (a) Somatic: hot flushes, heart discomfort, sleeping problems, and muscle or joint problems; (b) Psychological: depressive mood, irritability, anxiety, and physical or mental exhaustion; and (c) Urogenital: sexual issues, bladder problems, and dryness of the vagina. Respondents rank these symptoms from 0 (not present) to 4 (very severe). Scores are calculated for individual respondents as sums of each graded item, each subscale, and overall total. Scores equal to or above 9 (somatic), 7 (psychological), 4 (urogenital), and 17 (total) are defined as severe.<sup>8,9</sup>

Participants were asked about general demographic characteristics (e.g., age, ethnic group, education level, smoking, self-reported height and weight), reproductive history (e.g., age of menarche, menopausal status, children) and menopausal hormone therapy (MHT) use.

Based on previous research the prevalence of menopausal symptoms among women was estimated to be approximately 40%<sup>10</sup>. The size of the female population within the age group to be sampled was 1,092,119<sup>11</sup>. Allowing for a 95% confidence of 10% on either side of the true prevalence, the required sample size was calculated to be approximately 260.

Statistical analysis was carried out using IBM SPSS Version 27. Descriptive analyses were performed on all data collected. The Kolmogorov–Smirnov test was used to determine the normality of data distribution and according to this, non-normal continuous data (non-parametric data) were compared with the Mann–Whitney U test. Chi-Square ( $\chi^2$ ) tests of independence were used to examine the association between menopausal status of women for all categorical variables. A multiple linear regression model was applied to investigate the potential risk factors of menopausal symptom score. The factors used in the regression model were menopausal status, age, BMI, education, smoking status, age at menarche and whether they had children. P-value of <0.05 was considered statistically significant throughout. Women using menopausal hormone therapy (MHT) were excluded from all but the initial descriptive analyses.

## Results

### *Menopausal status and participant characteristics*

A total of 308 perimenopausal (n=156) and postmenopausal (n=152) women completed the online questionnaire (Table 1), the majority (n=305, 99%) were Caucasian and 88% (n=272) had children. The mean age for perimenopausal women was 48.37 years (SD  $\pm$ 4.62) and 54.31 (SD  $\pm$ 4.50) for postmenopausal women. The majority of women were educated to third level (n=180, 58%) and this was higher in the perimenopausal group (n=102, 65%) compared to postmenopausal women (n=78, 51%). Of the total, 47% (n=145) were normal weight, 30% (n=92) had overweight, and 23% (n=71) had obesity. Perimenopausal women were more likely to report having overweight and obesity (n=50, 32% and n=47, 30%, respectively) compared to postmenopausal women (n=43, 28% and n=23, 15%, respectively). Only 8% (n=26) of women reported being current smokers. Most women (n=296, 96%) knew their age at menarche with the average age 12.86 years (SD  $\pm$  5.04). Of the 152 postmenopausal women, 97% (n=147) reported their age at last menstrual period (LMP). The mean age for LMP was 50.27 years (SD  $\pm$ 2.76) while the average duration since LMP was 4.06 years (SD  $\pm$ 3.52). Overall, 17% (n=53) of participants were using menopausal hormonal therapy (MHT) and this was higher in perimenopausal women (n=32, 21%) compared to 14% (n=21) of postmenopausal women.

*Table 1: Characteristics of the participants by menopausal status*

	<i>All (n=308)</i>	<i>Perimenopause (n=156)</i>	<i>Postmenopause (n=152)</i>
<i>Age</i>	51.3 years $\pm$ 5.18	48.37 years $\pm$ 4.03	54.31 years $\pm$ 4.47
<i>Age at Menarche</i>	12.86 $\pm$ 5.04 (n=296)	12.95 $\pm$ 1.58 (n=146)	12.79 $\pm$ 1.58 (n=150)
<i>Body Mass Index (BMI)</i>	26.58 $\pm$ 5.04 (n=306)	27.40 $\pm$ 5.6 (n=155)	25.74 $\pm$ 4.26 (n=151)
<i>MHT use</i>			
<i>Yes</i>	53 (17.2%)	32 (20.5%)	21 (13.8%)
<i>No</i>	255 (82.8%)	124 (79.5%)	131 (86.2%)
<i>Education</i>			

<i>Secondary School</i>	86 (27.9%)	35 (22.4%)	51 (33.6%)
<i>Vocational or apprenticeship training</i>	42 (13.6%)	19 (12.2%)	23 (15.1%)
<i>College/University</i>	180 (58.4%)	102 (65.4%)	78 (51.3%)
<i>Smoking Status</i>			
<i>Non-smoker</i>	225 (73%)	108 (69.2%)	117 (77%)
<i>Smoker</i>	26 (8.4%)	12 (7.7%)	14 (9.2%)
<i>Vaper</i>	13 (4.2%)	10 (6.4%)	3 (2%)
<i>Ex-smoker</i>	44 (14.3%)	26 (16.7%)	18 (11.8%)
<i>Ethnicity</i>			
<i>Caucasian</i>	305 (99%)	154 (98.7%)	151 (99.3%)
<i>Asian</i>	2 (0.6%)	2 (1.3%)	0
<i>Black</i>	1 (0.3%)	0	1 (0.7%)
<i>Children</i>			
<i>Yes</i>	272 (88.3%)	140 (89.7%)	132 (86.8%)
<i>No</i>	36 (11.7%)	16 (10.3%)	20 (13.2%)

### *Prevalence and severity of menopausal symptoms*

Table 2 includes the most commonly reported menopausal symptoms which were hot flushes and sweating (n=214, 84%) followed by sleep problems (n=211, 83%), sexual problems (n=189, 74%) and joint and muscular discomfort (n=183, 72%) with the least prevalent symptoms including heart discomfort (n=107, 42%) and bladder problems (n=144, 57%). Postmenopausal women were more likely to experience hot flushes (n=129, 98%) and dryness of the vagina (n=111, 84.7%) compared to perimenopausal women (n=85, 66%) and (n=67, 54%) respectively, both statistically significant ( $p < 0.001$ ). Whereas perimenopausal women reported more sleep problems (n=109, 88% v n=102, 78%), ( $p=0.034$ ), heart discomfort (n=68, 55% v n=39, 30%) physical and mental exhaustion (n=108, 87% v n=72, 55%), depressive mood (n=106, 86% v n=46, 35%) irritability (n=105, 85% v n=59, 45%), anxiety (n=101, 82% v 53, 41%), and joint and muscular discomfort (n=100, 81% v n=83, 63%) compared to postmenopausal women and these were all statistically significant ( $p < 0.001$ ). No significant difference was observed between the two groups for sexual problems (Table 2).

*Table 2: Proportion of menopausal symptoms among participants according to menopausal status*

<i>Subscale (menopausal symptoms)</i>	<i>All (n=255)</i>	<i>Perimenopause (n=124)</i>	<i>Postmenopause (n=131)</i>	<i>χ<sup>2</sup></i>	<i>P</i>
<i>Somatic</i>					
<i>Hot flushes, sweating</i>	214 (84%)	85 (68.5%)	129 (98%)	43.73	<0.001
<i>Heart discomfort</i>	107 (42%)	68 (54.8%)	39 (29.8%)	16.43	<0.001
<i>Sleep problems</i>	211 (82.7%)	109 (87.9%)	102 (77.9%)	4.498	0.034
<i>Joint and muscular discomfort</i>	183 (71.8%)	100 (80.6%)	83 (63.4%)	10.38	0.001
<i>Psychological</i>					
<i>Depressive mood</i>	152 (59.6%)	106 (85.5%)	46 (35.1%)	67.13	<0.001
<i>Irritability</i>	164 (64.3%)	105 (84.7%)	59 (45%)	43.61	<0.001
<i>Anxiety</i>	154 (60.4%)	101 (81.5%)	53 (40.5%)	44.75	<0.001
<i>Physical &amp; mental exhaustion</i>	180 (70.6%)	108 (87.1%)	72 (55%)	31.69	<0.001
<i>Urogenital</i>					
<i>Sexual problems</i>	189 (74.1%)	94 (75.8%)	95 (72.5%)	0.359	0.549
<i>Bladder problems</i>	144 (56.5%)	78 (62.9%)	66 (50.4%)	4.06	0.044
<i>Dryness of vagina</i>	178 (69.8%)	67 (54%)	111 (84.7%)	28.49	<0.001

The overall average MRS score was  $13 \pm 7.6$  (ranging from 1 to 34 out of a maximal score of 44 (Table 3)). Perimenopausal women were more likely to have a higher overall MRS score ( $15.17 \pm 6.79$ ) compared to postmenopausal women ( $10.76 \pm 7.77$ ) and this was significantly different ( $p=0.003$ ). Similarly, perimenopausal women had statistically higher ( $p<0.001$ ) psychological subscale scores ( $6.28 \pm 3.39$ ) compared to postmenopausal women ( $3.08 \pm 3.82$ ). No differences were observed for somatic and urogenital subscales.

*Table 3: Menopause Rating Scale (MRS) Scores by menopausal status*

		All (n=255)	Perimenopause (n=124)	Postmenopause (n=131)	p
Overall	MRS	12.91 (±7.62)	15.17 (±6.79)	10.76 (±7.77)	0.003
	score				
	Somatic subscale	4.76 (±2.71)	5.24 (±2.69)	4.31 (±2.66)	0.290
	Psychological subscale	4.64 (±3.95)	6.28 (±3.39)	3.08 (±3.82)	<0.001
	Urogenital subscale	3.51 (±7.62)	3.65 (±2.57)	3.37 (±2.36)	0.101

The severity of menopausal symptoms was also assessed using the MRS (Table 4). Thirty one percent of women (n=78) had a total MRS score above 17, which is defined as severe. The severity of menopause symptoms by subscale was also explored. About 12% (n=30) of women scored in the severe range on the somatic subscale, 35% (n=89) scored as severe on the psychological subscale, and 40% (n=103) on the urogenital subscale. Perimenopausal women were statistically more likely to experience more severe overall symptoms and psychological symptoms compared to postmenopausal women (p=0.006, and p<0.001, respectively).

*Table 4: Frequency of severe menopausal symptoms (overall and by subscale) by menopausal status*

		All (n=255)	Perimenopause (n=124)	Postmenopause (n=131)	χ <sup>2</sup>	p
Overall	MRS severe score (MRS >17)	78 (30.6%)	48 (38.7%)	30 (22.9%)	7.49	0.006
	Somatic severe subscale	30 (11.8%)	17 (13.7%)	13 (9.9%)	0.88	0.358
	Psychological severe subscale	89 (34.9%)	61 (49.2%)	28 (21.4%)	21.69	<0.001
	Urogenital severe symptoms	103 (40.4%)	57 (46.0%)	46 (35.1%)	3.12	0.078

A multiple linear regression was run to predict total menopausal scores and subscores from age, body mass index, menopausal status, smoking status, education, children, and age at first period. Body mass index and stage of menopause was associated with significantly higher total MRS scores ( $\beta = -0.278$ ,  $p = <0.001$  and  $\beta = 0.248$ ,  $p = 0.002$ , respectively) as well as a higher psychological subscore ( $\beta = -0.303$ ,  $p = <0.001$  and  $\beta = 0.272$ ,  $p = <0.001$ , respectively). Age, BMI and menopausal status were associated with higher somatic scores ( $\beta = 0.197$ ,  $p = 0.01$ ,  $\beta = 0.268$ ,  $p = <0.001$  and  $\beta = 0.226$ ,  $p = 0.004$ , respectively).

## Discussion

To the authors knowledge, this is the first study to describe the prevalence and severity of menopausal symptoms in peri and post-menopausal women living in Ireland. Most of our participants were white Caucasian (99%) and a high proportion had a third level degree (58%) similar to the Irish population (56% of females aged 45-54 years attaining a third level degree)<sup>12</sup>. The self-reported average age at menarche was 13 years, which is consistent with international findings<sup>13</sup> and the mean age at last menstrual period (LMP) was 50 years suggesting menopause at 51 years of age, reflective of other studies in Caucasian women from the developed world.<sup>14</sup> Overall, 17% of participants were using menopausal hormonal therapy (MHT) and this was higher in perimenopausal women (21%) compared to 14% of postmenopausal women.

In our study of 255 women, the mean MRS total score was  $12.91 \pm 7.62$  and 30.6% women had severe menopausal symptoms (MRS score  $\geq 17$ ). The most prevalent symptoms were hot flushes and sweating (84%) followed by sleep problems (83%), and sexual problems (74%). These findings reflect other studies conducted in western countries. Mishra & Kuh<sup>15</sup> reported the most common menopausal symptom as sleep disturbances followed by hot flushes or night sweats (80.7%) and memory problems (75.6%) with 73% of participants experiencing symptoms of incontinence in a UK longitudinal study. In a cross-sectional study conducted in the USA, Marlatt et al<sup>16</sup> reported the most common menopausal symptoms as insomnia, sex drive, hot flashes, and night sweats with more than a 50% chance of participants reporting a moderate or severe rating for the top three symptoms.

When considering menopausal stage, perimenopausal women, compared to postmenopausal women, reported more psychological issues including sleep problems (88% v 78%) and physical and mental exhaustion (87% v 55%). This has been reported elsewhere with higher reported rates of psychological issues observed in perimenopausal women compared to postmenopausal women.<sup>17,18</sup> It has been suggested that fluctuating hormonal levels during the menopausal transition might influence the brain via hypothalamic and hippocampal function. Serotonin and GABA signalling are affected by the steroid hormones and combined with fluctuating neuronal opioids during menopause have been associated with depression,



irritability, and anxiety. Postmenopausal women were more likely to experience hot flushes compared to perimenopausal women ( $p < 0.001$ ) similar to other findings.<sup>19</sup> Vasomotor symptoms are one of the most common features of the menopausal transition with a majority of women rating them as moderate to severe.<sup>20</sup> They can have wide ranging implications for quality of life and are often the most common driver for women to seek medical assistance.<sup>19</sup>

Multiple linear regression analysis showed that higher body mass index and menopausal status, were related to higher MRS, somatic and psychological scores. In this study, self-reported height and height indicated that 30% of participants had overweight, and 23% had obesity and aligns with Healthy Ireland 2022 findings<sup>21</sup> (34% of women with overweight and 34% with obesity in the 45-54 years age category). Weight gain during midlife has been attributed to the ageing process combined with a decrease in physical activity and other lifestyle factors. Additionally, oestrogen deficiency associated with the menopause results in both physiologic and metabolic changes, which has been shown to affect lipid metabolism, energy consumption, and body composition, with many women experiencing increased abdominal and visceral fat.<sup>22</sup> Higher body mass index has also been associated with increased symptom reporting during the menopausal transition although these findings are inconsistent and warrant further research.<sup>22</sup> However, research would indicate that lifestyle interventions focusing on exercise and health education may offer a potential option for symptom management and improved health at this stage of life.<sup>23</sup>

The current study had limitations including a cross-sectional design, thus limiting ability to infer causality and confounding. Longitudinal studies addressing women's health including menopause status and symptom experience should be established. Additionally, more background information, including medical history, family history, reproductive health experiences would have been beneficial to provide further insight. It must also be acknowledged that the majority of participants were white Caucasians and therefore our findings are not generalizable to all women. Given existing research on menopause symptoms and the prevalence of these among women in this study, additional bespoke support services are required for women going through menopause.

**Declarations of Conflicts of Interest:**

None declared.

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