Open Access Original Article

# Workplace Challenges and their Impact on Quality of Life Among Women in Midlife and Beyond

Nabia Tariq, Anum Shahid, Asmara Ahmed Malik\*, Najm us Saqib Khan\*\*

Department of Gynecology, Maroof International Hospital, Islamabad Pakistan, \*Department of Public Health, National University of Medical Sciences (NUMS) Rawalpindi Pakistan, \*\*Department of Public Health, Ministry of Health, Govt of Pakistan

## **ABSTRACT**

*Objective:* To identify workplace challenges experienced by women in midlife and beyond and determine the impact of these challenges on their Quality of Life.

Study Design: Analytical cross-sectional study.

Place and Duration of Study: Islamabad, Pakistan, from March to December 2023.

*Methodology:* This study included working women between the ages of 45 to 65 years, who were invited to participate in an online survey hosted on Google Forms. The survey was a structed and validated questionnaire, comprising demographic details and questions related to time utilization, job satisfaction and facing workplace challenges.

**Results:** The researchers enrolled 282 female participants from Islamabad, Pakistan, majority (160, 56.7%) of whom were between the ages of 45-50 years and reported having full-time employment (162, 57.4%). While most participants felt that they did not face organizational discrimination in their workplace (192, 68.1%), a lot of participants also responded that they had faced employment rejection due to being in midlife (176, 62.4%) and had taken extra efforts to maintain their appearance (149, 52.8%). Statistical tests were applied where p-value ≤0.05 was considered significant.

*Conclusion:* Majority women reported no organizational discrimination at work, experienced no economic challenges and feared no age-related job threats. Participants who reported occasionally taking time off work for themselves and spent time frequently with family and friends felt no need to take early retirement indicating high job satisfaction.

Keywords: Job Satisfaction, Occupational Stress, Quality of Life, Working Women, Work-Life Balance.

How to Cite This Article: Tariq N, Shahid A, Malik AA, Khan NS. Workplace Challenges and their Impact on Quality of Life Among Women in Midlife and Beyond. Pak Armed Forces Med J 2025; 75(Suppl-5): S724-S729. DOI: <a href="https://doi.org/10.51253/pafmj.v75iSUPPL-5.13273">https://doi.org/10.51253/pafmj.v75iSUPPL-5.13273</a>

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (https://creativecommons.org/licenses/by-nc/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

#### INTRODUCTION

Women aged over 50 years represent a rapidly growing segment of the global workforce, with employment rates ranging from 55% to 67% in developed countries, where this shift coincides with the onset of menopause, which typically occurs at a median age of 51 years, with this transition lasting approximately four to eight years, marked by symptoms such as hot flashes, night sweats, and cognitive impairments, all of which can affect overall well-being,1,2 especially as studies indicate that menopausal symptoms can negatively affect work performance and job satisfaction, leading to direct and indirect costs for employers.1 In the West, where women hold up to 77% of jobs in the health and social care sector, menopause has a substantial impact,<sup>3</sup> and recent studies highlight that many menopausal women are engaged in informal or precarious employment, lacking workplace protections and creating limited financial stability.4 The growing focus on menopause in the workplace marks a crucial step

Correspondence: Dr Asmara Ahmed Malik, Department of Public Health, NUMS Rawalpindi, Pakistan

Received: 18 Mar 2025; revision received: 15 May 2025; accepted: 16 Jun 2025

in addressing this long-neglected aspect of women's health.<sup>5</sup> Many women face difficulties managing menopausal symptoms at work and are reluctant to disclose their status due to fears of stigma, with menopause not recognized as a critical issue requiring attention.<sup>6</sup> Employers must be encouraged to foster supportive environments by raising awareness and implementing internal organizational guidance.7 Women aged 50-55 years can experience severe menopausal symptoms and are more likely to leave employment or reduce their working hours, which not only affects their immediate income but also hinders their ability to build adequate pension contributions and savings, putting their long-term financial security at risk.8 Thus, there is an increasing interest in developing effective workplace strategies to alleviate menopausal symptoms and enhance the quality of work life for women navigating this transition.<sup>9,10</sup> This study was conducted to examine the workplace challenges experienced by women in midlife and beyond, addressing mental, financial, familial, and personal issues as exploring the experiences of menopausal women in the workforce can help identify these challenges and help to propose solutions.

#### **METHODOLOGY**

This analytical cross-sectional study was conducted in Islamabad, Pakistan, from March to December 2023. Permission was obtained from the Ethical Review Board of Maroof Internation Hospital via letter number RD/2023-09, dated 1st March 2023. Sample size came out to be 225 and was calculated using OpenEpi, an online sample size calculator, using a 30% occurrence of job satisfaction among working women, as found in literature. 10,11 The sample was enrolled through a non-probability convenience sampling technique.

**Inclusion Criteria:** Women aged 45–64 years, who were employed or had workplace experience within the past 12 months were included.

**Exclusion Criteria:** Women less than 45 years in age, with a current or prior diagnosis of mental health conditions (e.g., depression, anxiety disorders), autoimmune disorders, active malignancy, or ongoing use of prescription medications for chronic conditions were excluded.

A self-designed and structured data collection tool was used, which demonstrated strong content validity through iterative revisions guided by feedback from three experts in workplace psychology and was also administered for pre-testing on 10% of the calculated sample size (28 participants). After paraphrasing wording of one question, it was administered to the rest of the participants after obtaining informed consent. Cronbach-alpha testing for reliability was not applicable on the tool as only two questions were on a Likert scale and rest were all close ended. Data from these participants was included in the final analysis as their responses were the same as the other participants. It included sections on participant demographics, job satisfaction, and workplace challenges. It was distributed electronically by sharing a link to a Google Form across social media platforms such as WhatsApp, Facebook, and Instagram, targeting diverse groups of working women. The researchers specifically employed women in midlife, including full-time, parttime, or contractual roles, across diverse sectors, including healthcare, education, sanitation and private sector roles, to capture challenges unique to this demographic in occupational settings. Incomplete responses (<80% completion) and duplicates were excluded from the final data analysis. Dependent variable was Job satisfaction, which was a continuous score derived from Likert-scale responses) while independent variables were demographic factors (age, education, marital status), occupational factors (sector, work hours, employment type) and workplace stressors (qualitative responses categorized post-hoc). We analyzed all data using IBM SPSS (Statistical Package for the Social Sciences) version 28.0 for quantitative analysis. Descriptive Statistics were applied using frequencies and percentages for qualitative variables. Chi-square was applied for association between variables where p-value of  $\leq$ 0.05 was set as significant.

## **RESULTS**

The survey was completely and correctly filled by 282 participants from Islamabad, Pakistan. All participants were female with most aged between 45-50 years (160, 56.7%) and having full-time jobs (162, 57.4%). While most participants (129, 45.7%) reported being satisfied with their working hours, most participants (143, 50.7%) also reported thinking about their work when not at their job which due to which many participants reported only occasionally having time off from their job (112, 39.7%). Further details are listed in Table-I.

Table-I: Frequency and Distribution of Demographic Variables, Time Utilization and Job Satisfaction (n=282)

Demographic Variables		n (%)		
Age	45-50 years	160 (56.7%)		
	51-55 years	65(23.0%)		
	56-60 years	31(11.0%)		
	61-64 years	26(9.2%)		
Type of Job	Self employed	50(17.7%)		
	Full time job	162(57.4%)		
	Contract job	70 (24.8%)		
Monthly Income	Less than PKR 25000	30(10.6%)		
	Between PKR 25000- 50000	60(21.3%)		
	Between PKR 50000- 100000	54(19.1%)		
	More than PKR 100000	138(48.9%)		
Time Utilization	n(%)			
Time off work for self	Never	26(9.2%)		
	Rarely	102(36.2%)		
	Occasionally	112(39.7%)		
	Frequently	42(14.9%)		
With family and friends	Never	15(5.3%)		
	Rarely	45(16.0%)		
	Occasionally	107(37.9%)		
	Frequently	115(40.8%)		
Job Satisfaction		n(%)		
	Strongly dissatisfied	12(4.3%)		
Satisfaction with working hours	Dissatisfied	35(12.4%)		
	Neutral	68(24.1%)		
	Satisfied	129(45.7%)		
	Strongly satisfied	38(13.5%)		
Frequency of Thinking about Work when Not at Work	Frequently	143(50.7%)		
	Occasionally	87(30.9%)		
	Rarely	39(13.8%)		
	Never	13(4.6%)		

Table-II: Association of Job Satisfaction with Personal Variables (n=282)

Job Satisfaction and Personal Variables		Strongly dissatisfied	Dissatisfied	Neutral	Satisfied	Strongly satisfied	<i>p</i> -value
		n (%)	n (%)	n (%)	n (%)	n (%)	
Thinking about work when not actually at work	Frequently	4 (2.8%)	19 (13.3%)	36 (25.2%)	65(45.5%)	19(13.3%)	<0.001
	Occasionally	3 (3.4%)	7 (8.0%)	24 (27.6%)	41(47.1%)	12(13.8%)	
	Rarely	0 (0.0%)	5 (12.8%)	7 (17.9%)	2153.8%	615.4%	
	Never	5 (38.5%)	4 (30.8%)	1(7.7%)	2(15.4%)	1(7.7%)	
Faced organizational discrimination at workplace due to age	Yes	10 (11.1%)	17(18.9%)	20(22.2%)	36(40.0%)	7(7.8%)	<0.001
	No	2 (1.0%)	18(9.4%)	48(25.0%)	93(48.4%)	31(16.1%)	
Experienced/feared economic challenges	Yes	9(7.1%)	19(15.0%)	37(29.1%)	51(40.2%)	11(8.7%)	0.009
	No	3(1.9%)	16(10.3%)	31(20.0%)	78(50.3%)	27(17.4%)	
Faced employment rejection	Yes	10(9.4%)	12(11.3%)	35(33.0%)	43(40.6%)	6(5.7%)	<0.001
	No	2(1.1%)	23(13.1%)	33(18.8%)	86(48.9%)	32(18.2%)	
Take extra efforts to maintain appearance	Yes	9(6.0%)	17(11.4%)	43(28.9%)	64(43.0%)	16(10.7%)	0.007
	No	3(2.3%)	18(13.5%)	25(18.8%)	65(48.9%)	22(16.5%)	0.097
Days took off in a year for being unable to cope with stress and age-related issues	More than a month	2(4.3%)	4(8.7%)	11(23.9%)	20(43.5%)	9(19.6%)	0.013
	One month	0(0.0%)	5(13.9%)	8(22.2%)	16(44.4%)	7(19.4%)	
	One week	4(3.6%)	12(10.7%)	32(28.6%)	51(45.5%)	13(11.6%)	
	Twice a week	5(18.5%)	7(25.9%)	6(22.2%)	6(22.2%)	3(11.1%)	
	Once a week	1(1.6%)	7(11.5%)	11(18.0%)	36(59.0%)	6(9.8%)	
Need to take an early retirement due to	Yes	8(8.5%)	21(22.3%)	28(29.8%)	30(31.9%)	7(7.4%)	<0.001
workplace challenges	No	4(2.1%)	14(7.4%)	40(21.3%)	99(52.7%)	31(16.5%)	
Organization took any initiatives to	Yes	6(8.3%)	5(6.9%)	22(30.6%)	31(43.1%)	8(11.1%)	0.080
facilitate midlife challenges of employees	No	6(2.9%)	30(14.3%)	46(21.9%)	98(46.7%)	30(14.3%)	
Time off work for own self	Never	7(26.9%)	4(15.4%)	4(15.4%)	8(30.8%)	3(11.5%)	<0.001
	Rarely	4(3.9%)	17(16.7%)	28(27.5%)	39(38.2%)	14(13.7%)	
	Occasionally	1(0.9%)	10(8.9%)	28(25.0%)	58(51.8%)	15(13.4%)	
	Frequently	0(0.0%)	4(9.5%)	8(19.0%)	24(57.1%)	6(14.3%)	
Spend time with friends and family	Never	6(40.0%)	4(26.7%)	5(33.3%)	0(0.0%)	0(0.0%)	<0.001
	Rarely	4(8.9%)	11(24.4%)	9(20.0%)	13(28.9%)	8(17.8%)	
	Occasionally	2(1.9%)	11(10.3%)	26(24.3%)	54(50.5%)	14(13.1%)	
	Frequently	0(0.0%)	9(7.8%)	28(24.3%)	62(53.9%)	16(13.9%)	
Time spent on household activities	More than 6 hours	2(4.0%)	3(6.0%)	17(34.0%)	19(38.0%)	9(18.0%)	0.375
	4-6 hours	4(3.8%)	13(12.4%)	24(22.9%)	54(51.4%)	10(9.5%)	
	Less than 4 hours	6(4.7%)	19(15.0%)	27(21.3%)	56(44.1%)	19(15.0%)	
Exercise frequency	Never	7(6.7%)	12(11.5%)	32(30.8%)	41(39.4%)	12(11.5%)	0.071
	Once a week Never	4(4.3%)	11(12.0%)	24(26.1%)	45(48.9%)	8(8.7%)	
	Two times a week	1(2.2%)	6(13.0%)	3(6.5%)	26(56.5%)	10(21.7%)	
	Five times a week	0(0.0%)	6(15.0%)	9(22.5%)	17(42.5%)	8(20.0%)	

As shown in Table-II, the majority of participants felt that they did not face organizational discrimination at their workplace (192, 68.1%) with most (155, 55%) reporting that they had not experienced or feared economic challenges at their workplace, however, most participants also responded that they had faced employment rejection due to being in midlife (176, 62.4%) and had taken extra efforts to maintain their appearance (149, 52.8%) due to being in midlife. Chisquare was applied and *p*-value ≤0.05 was found for participants who reported no organizational discrimination at work, experienced no economic challenges, faced no employment rejection, took a month off to face stress and age-related issues, felt no need to take early retirement, but occasionally could take time off work for themselves and spent time frequently with family and friends. No significant statistical correlation between job satisfaction and frequency of exercise or duration of household activities.

Figure-1 shows that positive mental health was most prevalent among individuals exercising two times (56.5%) or five times per week (42.5%), while those who never exercised showed only 30.8% positive ratings. Spending 4-6 hours daily on household activities was associated with the highest well-being (51.4%), compared to 44.1% for less than 4 hours and 38.0% for more than 6 hours. Frequent time spent with friends and family yielded 53.9% positive well-being, whereas respondents who never did so reported 40.0% poor well-being and 0% positive. Regular self-care showed a strong association with well-being (57.1%), while those neglecting self-care had a 26.9% negative rating. Mental health was also better among individuals taking no days off (44.5%) or one day off weekly (59.0%) due to stress, while frequent absences (e.g., twice a week or more than a month) were associated with lower well-being (both at 18.5%). This indicates that physical activity, moderate household engagement, social interaction, and personal time are

positively correlated with mental well-being, whereas isolation, inactivity, and frequent stress-related absenteeism are linked to poorer mental health outcomes.

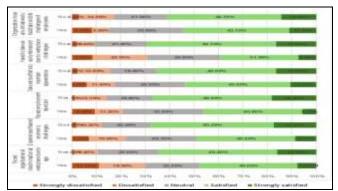


Figure-1: Personal Factors and Job Satisfaction (n=282)

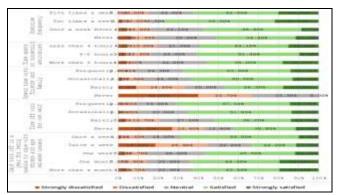


Figure-2: Time Utilization and Job Satisfaction (n=282)

As shown in Figure-2, individuals not compelled into early retirement due to workplace issues exhibited better outcomes (52.7% positive, 16.5% excellent), whereas those who were forced to exit early demonstrated increased distress, with 8.5% reporting very poor and 22.3% poor mental health. Experience of employment rejection was associated with elevated mental distress (9.4% very poor, 11.3% poor) and facing workplace challenges vielded similarly detrimental outcomes, with 7.1% reporting very poor and 15.0% poor mental health. Age-related workplace discrimination further exacerbated poor mental health, with 11.1% reporting very poor and 18.9% poor outcomes, while only 22.3% in this group reported positive mental health compared to 48.4% among those who did not face discrimination. These results underscore that supportive, inclusive, and nondiscriminatory work environments are critical for safeguarding employee mental well-being, while factors such as rejection, discrimination, undue

appearance expectations, and forced retirement are associated with deteriorated psychological outcomes.

## **DISCUSSION**

The aging population presents a significant challenge for workplaces globally. Menopause is increasingly recognized as a critical occupational health issue, particularly affecting women aged 50-6411. In contrast, the current cross-sectional survey revealed that most respondents were between 45 and 50 years old, working full-time from middle to high income class. Moreover, cultural, environmental, and social factors, along with attitudes toward aging, significantly influence women's experiences of menopausal challenges.<sup>12</sup> In the current study, the majority of participants reported that they did not encounter organizational discrimination in their workplace, with most indicating they had not experienced or feared economic challenges in their professional environment. In contrast to, precarious conditions, low wages, exploitation, and lack of workplace protections common in the casual sector and grey economy remain significant threats to the overall well-being of workers in many studies.<sup>13</sup> However, many participants noted experiencing employment rejection due to being in midlife and admitted to making extra efforts to maintain their appearance. A significant number also expressed feeling compelled to consider early retirement due to workplace challenges, citing a lack of organizational initiatives to address midlife issues faced by employees. This aligns with existing literature, which highlights that menopause is often associated with workplace challenges related to health and safety. Employment conditions and work-related stressors are closely linked to the reporting of menopausal perimenopausal symptoms among postmenopausal women.14 In the current study, most participants reported taking at least one week off annually due to difficulties in coping with stress and age-related challenges. Additionally, many admitted to frequently thinking about work even outside of working hours, indicating that workplace stress might be affecting their performance. This finding may be associated with menopausal changes, as symptoms such as poor concentration, fatigue, memory issues, feelings of depression or low mood, and reduced confidence are particularly disruptive in a professional setting.<sup>15</sup> In another study, over 90% of women reported that menopausal symptoms affected their work, with 18% describing their symptoms as severe,

significantly impacting productivity.16 In assessing the quality of life, 39% of participants reported that they only occasionally took time off from work, while approximately 41% indicated they frequently spent time with their families. Most participants were able to manage their household chores, typically dedicating less than four hours daily to these tasks. However, a notable observation was the low prevalence of regular exercise, with only 32% of participants reporting that they exercised at least once a week. Evidence highlights that adopting a healthy lifestyle - including regular exercise, sufficient rest, and strong social connections - can play a vital role in overcoming challenges, particularly menopausal workplace.<sup>17</sup> Conversely, a sedentary lifestyle, obesity, and low socioeconomic status are linked to a higher risk of experiencing menopausal symptoms18. Emphasizing the importance of adopting a healthy lifestyle could help women in midlife overcome workplace challenges, as there is documented evidence of a complex relationship between job stress and menopausal symptoms that affect women at work.<sup>19</sup> It is therefore crucial to recognize and proactively address the challenges faced by menopausal women to ensure a healthy and productive work environment.<sup>20</sup> Acknowledging the unique needs of menopausal women in the workplace is vital for fostering a supportive and inclusive environment. This requires addressing not only the physiological challenges but also the cultural, social, and organizational factors that influence women's overall well-being during this stage of life.

## LIMITATIONS OF STUDY

The cross-sectional design captured data at a single time point, limiting our ability to establish temporal relationships or causal inferences between variables. The relatively small sample size may have reduced the statistical power to detect significant associations and limits the generalizability of findings. The use of an online survey platform introduced potential selection bias, as participation was restricted to individuals with internet access, digital literacy, and familiarity with mobile technology platforms. Consequently, the study population was skewed toward more educated, employed women with technological proficiency, which may not be representative of the broader target population. This sampling methodology likely participants from lower socioeconomic backgrounds, older age groups, or those with limited digital access, thereby limiting the external validity of our findings.

## **CONCLUSION**

Majority women reported no organizational discrimination at work, experienced no economic challenges and feared no employment rejection due to their age. Participants who reported occasionally taking time off work for themselves and spent time frequently with family and friends felt no need to take early retirement indicating high job satisfaction.

#### **ACKNOWLEDGEMENTS**

Grateful acknowledgment is made to Dr Mommana Ali Rathore, AP Community Medicine, CMH Institute of Medical Sciences, Multan, for intellectual and academic support.

Conflict of Interest: None. Funding Source: None. **Authors' Contribution** 

Following authors have made substantial contributions to the manuscript as under:

NT & AS: Study design, drafting the manuscript, data interpretation, critical review, approval of the final version to be published.

AAM & NSK: Data acquisition, data analysis, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

#### **REFERENCES**

- 1. O'Neill MT, Jones V, Reid A. Impact of menopausal symptoms on work and careers: a cross-sectional study. Occup Med 2023; 73(6): 332-8.
  - https://doi.org/10.1093/occmed/kgad086
- 2. Adelekan-Kamara Y, Asunramu MH, Bhullar K, Duah-Asante KA, Leedham-Green K, Madaan A, et al. Factors underpinning an improved menopausal experience in the workplace for doctors: a UK-based qualitative study. BMJ Open 2023; 13(3):
  - https://doi.org/10.1136/bmjopen-2022-060265
- 3. Swaminathan A, Lepping P, Kumar G. Menopause, and mental health. Obstet Gynaecol 2023; 25(3): 229-38. https://doi.org/10.1111/tog.12848
- 4. Yoeli H, Macnaughton J, McLusky S. Menopausal symptoms and work: a narrative review of women's experiences in casual, informal, or precarious jobs. Maturitas 2021; 150: 14-21.
  - https://doi.org/10.1016/j.maturitas.2021.05.008
- 5. Jack G, Riach K, Hickey M, Griffiths A, Hardy C, Hunter M. Menopause in the workplace: Building evidence, changing workplaces, supporting women. Maturitas 2021; 151: 63-4. https://doi.org/10.1016/j.maturitas.2021.05.002
- 6. Pitman S. Menopause in the workplace and you. 2022.
- 7. Hardy C. Menopause and the workplace guidance: What to consider. Post Reprod Health 2020; 26(1): 43-45. https://doi.org/10.1177/2053369120911063
- 8. Rees M, Bitzer J, Cano A, Ceausu I, Chedraui P, Durmusoglu F, et al. Global consensus recommendations on menopause in the workplace: a European Menopause and Andropause Society (EMAS) position statement. Maturitas 2021; 151: 55-62. https://doi.org/10.1016/j.maturitas.2021.05.001

## Among Women in Midlife and Beyond

- 9. Rodrigo CH, Sebire E, Bhattacharya S, Paranjothy S, Black M. Effectiveness of workplace-based interventions to promote wellbeing among menopausal women: a systematic review. Post Reprod Health 2023; 29(2): 99-108.
  - https://doi.org/10.1177/20533691231161892
- Unison. The menopause is a workplace issue: guidance and model policy. 2019. https://www.unison.org.uk/content/uploads/2019/10/25831.pdf
- 11. Jafari M, Seifi B, Heidari M. Risk assessment: factors contributing to discomfort for menopausal women in the workplace. J Menopausal Med 2017; 23(2): 85-90. https://doi.org/10.6118/jmm.2017.23.2.85
- 12. Tonob D, Melby MK. Broadening our perspectives on complementary and alternative medicine for menopause: A narrative review. Maturitas 2017; 99: 79-85. https://doi.org/10.1016/j.maturitas.2017.01.006
- Healy G, Bergfeld M. The organising challenges presented by the increased casualisation of 'women's work': a report for the TUC. Centre for Research Equality and Diversity, Queen Mary University of London; 2016.
- 14. Bariola E, Jack G, Pitts M, Riach K, Sarrel P. Employment conditions and work-related stressors are associated with menopausal symptom reporting among perimenopausal and postmenopausal women. Menopause 2017; 24: 247-51. https://doi.org/10.1097/GME.0000000000000066

- Griffiths A, MacLennan SJ, Hassard J. Menopause, and work: an electronic survey of employees' attitudes in the UK. Maturitas 2013; 76: 155-159.
  - https://doi.org/10.1016/j.maturitas.2013.06.005
- 16. Menopause in the workplace and you. 2022. https://www.researchgate.net/publication/361822667
- 17. Burn K, Dennerstein L, Browning C, Szoeke C. Patterns of social engagement in the transition to later life. Maturitas 2016; 88: 90-95.
  - https://doi.org/10.1016/j.maturitas.2016.03.004
- Shobeiri F, Jenabi E, Poorolajal J, Hazavehei SM. The association between body mass index and hot Flash in midlife women: a meta-analysis. J Menopausal Med 2016; 22: 14-19.
  - https://doi.org/10.6118/jmm.2016.22.1.14
- 19. Sarrel PM. Women, work, and menopause. Menopause 2012; 19: 250-252.
  - https://doi.org/10.1097/gme.0b013e318246dd55
- Faubion SS, Enders F, Hedges MS, Chaudhry R, Kling JM, Shufelt CL, et al. Impact of menopause symptoms on women in the workplace. Mayo Clin Proc 2023; 98(6): 833-845. https://doi.org/10.1016/j.mayocp.2023.02.020