Contents lists available at ScienceDirect

Maturitas

journal homepage: www.elsevier.com/locate/maturitas

Original article

Severity of menopausal symptoms is associated with lower work-related quality of life and job satisfaction in midlife Latin American women: REDLINC XIII

María S. Vallejo [a,1], Juan E. Blümel [b,*,1], Peter Chedraui [c], Juan Matsumura-Kasano [d], Paolo Meza [e], Álvaro Monterrosa-Castro [f], Mónica Ñañez [g], Marcela López [h], Eliana Ojeda [i], Claudia Rey [j], Ana Lucia Ribeiro Valadares [k], Doris Rodríguez-Vidal [l], Marcio A.H. Rodrigues [m], Javier Saavedra [n], Carlos Salinas [o], Lida Sosa [p], Konstantinos Tserotas [q], Margot Acuña-San Martín [r], Marcela S. Aguirre [s], Eugenio Arteaga [t], Félix Ayala [u], Ascanio Bencosme [v], Andrés Calle [w], Lucia Costa-Paiva [x], Maribel Dextre [y], Karen Díaz [z], Alejandra Elizalde-Cremonte [aa], Santiago Elizalde-Cremonte [aa], Carlos Escalante [ab], María T. Espinoza [ac], Ircania García [ad], Gustavo Gómez-Tabares [ae], Hugo Gutiérrez-Crespo [af]

[a] *Servicio de Ginecología y Obstetricia, Hospital Clínico, Universidad de Chile, Santiago, Chile*
[b] *Departamento de Medicina Interna Sur, Facultad de Medicina, Universidad de Chile, Santiago, Chile*
[c] *Escuela de Postgrado en Salud, Universidad Espíritu Santo, Samborondón, Guayaquil, Ecuador*
[d] *Unidad de Investigación, Facultad de Medicina, Universidad Nacional Mayor de San Marcos, Lima, Peru*
[e] *Medicina Familiar, Hospital Nacional Cayetano Heredia, Lima, Peru*
[f] *Grupo de Investigación Salud de la Mujer, Universidad de Cartagena, Cartagena, Colombia*
[g] *II Cátedra de Ginecología, Universidad Nacional de Córdoba, Córdoba, Argentina*
[h] *Departamento de Ginecología y Obstetricia, Facultad de Medicina, Universidad de Santiago, Santiago, Chile*
[i] *Departamento Académico de Medicina Humana, Universidad Andina del Cusco, Cusco, Peru*
[j] *Asociación Argentina para el Estudio del Climaterio, Buenos Aires, Argentina*
[k] *Universidade Estadual de Campinas (UNICAMP), Campinas, Sao Paulo, Brazil*
[l] *Hospital de Clínicas José de San Martín, Universidad de Buenos Aires, Buenos Aires, Argentina*
[m] *Department of Gynecology and Obstetrics, Federal University of Minas Gerais, Belo Horizonte, Brazil*
[n] *Departamento de Medicina Interna, Facultad de Medicina, Universidad Mayor de San Simón, Cochabamba, Bolivia*
[o] *Servicio de Obstetricia y Ginecología, Hospital Ángeles, Puebla, Mexico*
[p] *Servicio de Ginecología, Hospital Central del Instituto de Previsión Social, Asunción, Paraguay*
[q] *Clínica Tserotas, y Departamento de Ginecología y Obstetricia Hospital Paitilla, Ciudad de Panamá, Panama*
[r] *Departamento de Obstetricia y Ginecología, Facultad de Medicina, Universidad de la Frontera (UFRO), Temuco, Chile*
[s] *Departamento de Climaterio, Hospital Escuela Eva Perón de Granadero Baigorria, Santa Fe, Argentina*
[t] *Departamento de Endocrinología y CETREN, Facultad de Medicina, Pontificia Universidad Católica de Chile, Santiago, Chile*
[u] *Departamento de Ginecología y Obstetricia, Facultad de Medicina, Universidad Nacional Mayor de San Marcos, Lima, Peru*
[v] *Medicina, Facultad de Ciencias de la Salud, Pontificia Universidad Católica Madre y Maestra, Santiago, Dominican Republic*
[w] *Centro Integral de Salud Obstétrica y Femenina, Facultad Ciencias de la Salud, Universidad Indoamérica, Academia Ecuatoriana de Medicina, Quito, Ecuador*
[x] *Department of Obstetrics and Gynecology, Universidade Estadual de Campinas, Campinas, Sao Paulo, Brazil*
[y] *Gynecology and Obstetrics, International Clinic, Lima, Peru*

* Corresponding author at: Departamento de Medicina Interna Sur, Facultad de Medicina, Universidad de Chile, Orquídeas 1068, Departamento 302, P.O. BOX 7510258, Providencia, Santiago de Chile, Chile.

E-mail addresses: vallejosoledad2036@gmail.com (M.S. Vallejo), jeblumelm@gmail.com (J.E. Blümel), pchedraui@uees.edu.ec (P. Chedraui), jmatzumura@yahoo.com (J. Matsumura-Kasano), paolito_mo@hotmail.com (P. Meza), fertilizar@gmail.com (Á. Monterrosa-Castro), monicalucino@gmail.com (M. Ñañez), dra.marcela.lopez.p@gmail.com (M. López), elianaojedalazo@gmail.com (E. Ojeda), crey9303@gmail.com (C. Rey), anarvaladares@gmail.com (A.L.R. Valadares), doris.merci@fibertel.com.ar (D. Rodríguez-Vidal), marcioahr@gmail.com (M.A.H. Rodrigues), jsb.med@gmail.com (J. Saavedra), gynecol01@hotmail.com (C. Salinas), lida_sosa@hotmail.com (L. Sosa), ktserotas@gmail.com (K. Tserotas), margotasm@msn.com (M. Acuña-San Martín), msaguirre@intramed.net (M.S. Aguirre), eugenioarteaga@gmail.com (E. Arteaga), fayala1401@hotmail.com (F. Ayala), drbencosme@icloud.com (A. Bencosme), andrescalle56@gmail.com (A. Calle), paivaepaiva@uol.com.br (L. Costa-Paiva), doctoramaribeldextre@gmail.com (M. Dextre), karendigo@hotmail.com (K. Díaz), aleelizaldecremonte@gmail.com (A. Elizalde-Cremonte), scremonteeli@gmail.com (S. Elizalde-Cremonte), dr.escalante@gmail.com (C. Escalante), maites09@hotmail.com (M.T. Espinoza), ircaniagarcia@gmail.com (I. García), gustavo.gomez.tabares@correounivalle.edu.co (G. Gómez-Tabares), hgutierrezc@gmail.com (H. Gutiérrez-Crespo).

https://doi.org/10.1016/j.maturitas.2026.108918
Received 5 July 2025; Received in revised form 11 March 2026; Accepted 16 March 2026

[z] Centro Ciudad Mujer, Ministerio de Salud, Asunción, Paraguay
[aa] Departamento de la Mujer, Niñez y Adolescencia, Facultad de Medicina de la Universidad Nacional del Nordeste, Corrientes, Argentina
[ab] Departamento de Ginecología, Facultad de Medicina, Universidad de Costa Rica, San José, Costa Rica
[ac] Unidad de Menopausia y Climaterio, Clínica Los Ángeles, Cochabamba, Bolivia
[ad] Centro Médico Moderno, Santo Domingo, Dominican Republic
[ae] Unidad de Medicina Reproductiva, Clínica Imbanaco, Universidad del Valle, Cali, Colombia
[af] Facultad de Medicina, Universidad Nacional Mayor de San Marcos, Lima, Peru

ARTICLE INFO

Keywords:
Menopause
Occupational well-being
Work-related quality of life
Menopausal symptoms
Hormone therapy
Working women

ABSTRACT

Background: Female participation in the workforce has increased, particularly among women over 50; hence, the influence of menopause on occupational well-being requires greater attention. Although the epidemiology of climacteric symptoms has been well documented, their impact on job satisfaction and work-related quality of life remains underexplored, especially in low- and middle-income countries, and is virtually absent from large, multinational studies in Latin America.

Objective: To evaluate the relationship between severe menopausal symptoms and occupational well-being among salaried, employed midlife women in Latin America.

Methods: A cross-sectional study was conducted between June 2024 and January 2025 across 30 centres in 12 Latin American countries, with a total of 2035 employed women (aged 40 to 60 years). Menopausal symptoms were assessed with the Menopause Rating Scale, and occupational well-being domains were assessed using the Work-Related Quality of Life Scale and the Job Satisfaction Scale. Hierarchical multiple linear regression analyses were conducted to assess the contribution of menopausal symptom severity to occupational well-being.

Results: Women with severe menopausal symptoms scored significantly lower across all domains of both the Job Satisfaction Scale and the Work-Related Quality of Life Scale. Hierarchical regression analyses showed that menopausal symptoms were the strongest predictors of job satisfaction ($R^2 = 0.133$). Higher education, menopausal hormone therapy use, and physical activity were positive predictors, whereas number of children, comorbidities, psychotropic medication use, and higher body mass index were associated with lower job satisfaction. For work-related quality of life ($R^2 = 0.121$), education, physical activity, and sexual activity were the main positive predictors, while psychological and severe menopausal symptoms were the strongest negative predictors. The final models explained 13.3% of the variance in job satisfaction and 18.7% in work-related quality of life.

Conclusions: This study, one of the first large multinational analyses in Latin-American, shows that the severity of menopausal symptoms is negatively associated with occupational well-being. These findings highlight the necessity for workplace strategies and public policies that recognise menopause as a significant determinant of women's occupational well-being.

1. Introduction

In recent decades, demographic and social shifts have significantly reshaped the role of women in society. One of the most notable changes has been their increasing participation in the labour market, notable in high-income and emerging economies [1,2]. This trend, fuelled by enhanced access to education, increased political engagement, and changing family structures, has significantly affected the social organisation of work and public policies. These changes have contributed to promoting gender equity [3]. Simultaneously, a sustained increase in female life expectancy has extended the postmenopausal period, which can now encompass over one-third of women's lifespan. In this context, a growing number of postmenopausal women remain active in the workforce, presenting new challenges for occupational health and workplace well-being.

Menopause, defined as the permanent cessation of menstruation due to the depletion of ovarian function, results in a progressive decline in the secretion of oestrogens and other sex hormones, hence affecting multiple physiological systems. This hormonal deficiency alters key processes such as energy homeostasis, inflammatory responses, bone and muscle health, and cognitive function [4]. While traditionally approached from a quality-of-life perspective, especially concerning vasomotor symptoms such as hot flushes and night sweats [5], it is now recognised that postmenopausal oestrogen deprivation induces broader metabolic and neuroendocrine changes. These changes may significantly impact daily functioning and occupational performance [6].

The pathophysiological complexity of menopause indicates that it is not merely a biological transition but a potentially critical stage for women's functional health, particularly in the context of extending their working functionality. Indeed, the growing participation of women over 50 in the workforce highlights the need for a more nuanced and contextualised understanding of the factors that may limit or compromise their working capacity, including both individual characteristics and concerns related to workplace conditions [7].

Several studies have documented that women at this stage may experience symptoms such as: persistent fatigue, sleep disturbances, headaches, musculoskeletal pain, impaired concentration, short-term memory loss, and mood changes [8,9]. These symptoms, frequently underestimated or overlooked in occupational settings, may diminish productivity, increase absenteeism, and contribute to a decline in physical and mental well-being among working women. Despite the high prevalence of such symptoms, few systematic investigations have evaluated their specific impact on job performance or the ability to remain professionally active during the postmenopausal period.

The present study sought to assess the potential impact of menopause on women's working activities. Given the broad range of climacteric symptoms and their possible interference with cognitive, physical, and emotional demands across various types of employment, it is important to determine if the physiological menopausal transition represents a turning point in occupational capacity. We hypothesised that greater severity of menopausal symptoms would be associated with poorer work-related quality of life (WRQoL) and lower job satisfaction. The timely recognition of this process could enable the implementation of targeted interventions aimed at mitigating the adverse effects of menopause, whether through workplace adjustments, occupational health strategies, or the rational and individualised use of menopausal hormone therapy (MHT). Hence, the presented study aimed to

[1] María S. Vallejo and Juan E. Blümel are joint first authors.

determine the relationship between severe menopausal symptoms and occupational well-being among salaried, employed midlife women of Latin America, with job satisfaction and WRQoL as primary outcomes. Several studies, primarily from Anglo-Saxon countries, have shown that menopausal symptoms are associated with reduced work capacity [10–12]. Moreover, the SWAN study demonstrated significant ethnic differences in the prevalence and severity of menopausal symptoms among four North American ethnic groups [13]. These findings highlight the relevance of examining whether similar associations exist among Latin American women, a population that remains markedly underrepresented in the literature. Furthermore, findings may contribute to the development of more inclusive policies in Latin America based on a life-course approach to female workers—particularly at a time when gender equity and healthy ageing have become key priorities in global public health agendas.

2. Methods

2.1. Study design and participants

This was a multi-center, cross sectional study (REDLINC XIII) conducted between June 2024 and January 2025 across 30 healthcare centres in twelve Latin American countries: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Panama, Paraguay, Peru, and the Dominican Republic. The participants were women aged 40 to 60, native Spanish or Portuguese speakers (in the case of Brazil), who attended their routine annual gynaecological check-ups and self-identified as being in otherwise good health. This condition was defined as the absence of clinically evident diseases or disorders and adequate physical, mental, and social functioning for their age and context, enabling them to carry out daily activities without significant limitations. Each participant completed self-administered questionnaires, which were subsequently reviewed by their physicians to ensure consistency and completeness. Data submission from each centre was contingent on 100% completion of all required fields, and incomplete records were excluded (n = 38; 1.03%). Women who had received chemotherapy or radiotherapy, undergone bilateral oophorectomy, experienced menopause before the age of 40, or had a body mass index (BMI) <18.5 kg/m^2 were excluded, as were those with hearing or visual impairments or a diagnosis of dementia that could have affected their understanding of the questionnaires. In addition, 178 women (4.8%) declined to participate and were not included in the final sample. More details regarding the methodology and recruitment process of the REDLINC XIII study are presented elsewhere [14].

The present analysis targeted women employed in the formal sector under a subordinate employment relationship (dependent workers), with a legal contract, social security coverage, and employer-based contributions to health and pension systems. Several considerations support this methodological choice. Firstly, the work environment of dependent employees tends to be more standardized, with defined schedules, established hierarchical supervision, and structured tasks. These features allow for better comparability between participants and reduce the heterogeneity associated with diverse forms of employment. Secondly, the formal employment relationship facilitates access to objective indicators related to work capacity, such as the number of worked hours, medical leave, absenteeism, changes in job performance, and supervisory assessments. The ability to validate self-reported data with formal records enhances the reliability of information gathered through surveys. Moreover, dependent workers are generally more susceptible to structured psychosocial demands, such as organisational pressure, low autonomy, productivity targets, and externally imposed performance goals. These factors pose significant risks when assessing declines in work capacity, particularly among women during critical life stages like the menopausal transition. Ultimately, selecting this population offers practical and directly applicable evidence for developing public policies aimed at improving women's occupational health, promoting active ageing at work, and designing targeted interventions within the context of formal employment.

2.2. Instruments

2.2.1. Demographic and health data

Sociodemographic, gynaecological, and general health data were collected and analysed. These included age (years), educational level (in years), and type of occupation, which was classified into three categories: homemaker, salary employed, or self-employed. Anthropometric measures included weight (in kg), height (in m), from which BMI was calculated as weight divided by height squared (kg/m^2).

Regarding reproductive history and sexual activity, the following variables were considered: parity (the total number of children), partnership status (the presence or absence of a stable partner), and recent sexual activity, defined as having had at least one sexual intercourse in the past year (yes/no). Menopausal status was classified according to the STRAW+10 criteria as premenopausal, perimenopausal, or postmenopausal [15]. Furthermore, we also recorded the current use of MHT (yes/no), tobacco consumption (yes/no), and physical inactivity (yes/no), defined as engaging in less than 150 min per week of moderate-intensity aerobic exercise (i.e. brisk walking, cycling, light sports, or dancing).

Lastly, we also registered the current use of psychotropic medication (antidepressants, hypnotics, or anxiolytics; yes/no) and the presence of comorbidities, defined as the current medical diagnosis and/or treatment of at least one of the following conditions: dyslipidaemia, diabetes mellitus, or arterial hypertension (yes/no).

No organisational or employer records were accessed or used to validate the self-reported data. All variables were based exclusively on participant self-reports, and questionnaire data were reviewed only for internal consistency and completeness.

2.2.2. Menopausal symptoms

Menopausal symptoms were assessed using the Menopause Rating Scale (MRS), a validated instrument that measures the presence and severity of such symptoms. The scale is composed of 11 items gathered into three subscales: Somatic: hot flushes, cardiac discomfort, sleep disturbances, and joint or muscular pain. Psychological: depressive mood, irritability, anxiety, and physical or mental exhaustion. Urogenital: sexual problems, urinary complaints, and vaginal dryness. Each item can be rated on a five-point Likert scale: 0 (absent), 1 (mild), 2 (moderate), 3 (severe), and 4 (very severe). Subscale scores are obtained by summing the individual item scores within each subscale, and the total MRS score is calculated by summing the scores obtained for each of the three subscales. In this study, severe menopausal symptoms were defined as a total MRS score equal to or greater than 14 points [16], and the officially validated Spanish [17] and Portuguese [18] MRS versions (the latter for participants from Brazil) were used.

2.2.3. The Work-Related Quality of Life Scale (WRQoL)

This tool was developed by Easton and Van Laar [19], to assess perceived WRQoL. It consists of 24 items which can be rated on a Likert scale, ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). The items are gathered in six subscales or domains: Control at Work (CAW), Home–Work Interface (HWI), General Well-Being (GWB), Working Conditions (WCS), Job and Career Satisfaction (JCS), and Stress at Work (SAW). For each domain, item scores are summed and averaged to obtain a representative score for that specific area. The total WRQoL score is calculated by summing up subscale scores, with higher scores indicating better perceived WRQoL. For this research the Spanish language version of the scale was used [20], except for Brazil, where the Portuguese language version was administered [21].

2.2.4. Job Satisfaction Scale (JSS)

Job satisfaction was measured using the scale developed by Warr

et al. [22]. This scale assesses the worker's subjective satisfaction with various aspects of their employment, such as recognition, autonomy, task variety, physical working conditions, interpersonal relationships, and remuneration. The instrument adopts a motivational perspective, aiming to identify satisfiers and dissatisfiers in the workplace. The original scale comprises 15 items, each rated on a 7-point Likert scale ranging from 1 ("extremely dissatisfied") to 7 ("extremely satisfied"). A mean score is calculated, with values equal to or greater than 5 indicating high job satisfaction. The validated versions of the scale existing in Spanish [23] and Portuguese (Brazil) language [24] were used in this research.

Together, these instruments offer a complementary assessment of workplace wellbeing, incorporating a holistic perspective on WRQoL and a more focused evaluation of satisfaction with specific job-related aspects.

2.3. Statistical analysis

All statistical analyses were performed using SPSS software, version 21.0 for Windows (SPSS Inc., Chicago, IL, USA). Continuous variables are presented as means and standard deviations (SD), while categorical variables are presented as percentages with 95% confidence intervals (CIs). Levene's test was employed to assess homogeneity of variances ($p > 0.05$ indicating homogeneity), and the Kolmogorov–Smirnov test was used to evaluate normality. Depending on these assumptions, comparisons of continuous variables were conducted using the Student's *t*-test or the Mann–Whitney *U* test. Categorical variables were compared using the chi-square test. A p value <0.05 was considered statistically significant.

Hierarchical multiple linear regression was conducted to evaluate the incremental contribution of menopausal symptom severity to WRQoL and job satisfaction (JSS). Predictors were entered in conceptually organised blocks:

1. Sociodemographic factors: age, years of education, number of children, partnered status, and sexual activity.
2. Lifestyle factors: BMI, smoking status, and physical activity.
3. Health-related factors: comorbidities and psychotropic medication use.
4. Menopausal variables: postmenopausal status, MHT use, and severity of menopausal symptoms.

This approach allowed assessment of the unique contribution of menopausal symptom severity beyond other explanatory domains. Model performance was evaluated using changes in R^2 across blocks, and standardized beta coefficients were used to assess the magnitude and direction of associations.

Additionally, a sensitivity analysis was performed to assess the robustness of the findings. In this analysis, WRQoL was dichotomised and logistic regression models were estimated. Menopausal symptom severity was alternatively defined using items 1 and 10 of the MRS, categorised as none, mild, or severe. The models were re-estimated using this alternative specification while maintaining the same covariates.

2.4. Ethical considerations

The study protocol was reviewed and approved by the Ethics Committee of the University of Cartagena (reference number 178-26-11-24-1-1), based in Cartagena, Colombia. The research was conducted in accordance with the principles outlined in the Declaration of Helsinki. Prior to participation, all women were completely informed regarding the study's objectives and procedures, after which they provided written informed consent to participate. This manuscript was initially written in Spanish and subsequently translated into English. Grammar and style corrections were made with Grammarly, an AI-based writing support tool.

3. Results

A total of 3701 women aged 40 to 60 were invited to participate in the REDLINC XIII study, with 178 (4.8%) declining, which led to a final sample of 3523 women included in the statistical analysis. Of these, 762 (21.6%) were homemakers, 726 (20.6%) were self-employed, and 2035 (57.8%) were dependent employed workers. Data analysis was performed using the latter as a sample.

The sociodemographic and clinical characteristics of the 2035 women included in this analysis are presented in Table 1, stratified according to the intensity of menopausal symptoms. Women experiencing severe symptoms were older (51.1 ± 5.1 vs. 49.6 ± 5.6 years, $p < 0.001$), had fewer years of education (14.2 ± 4.9 vs. 15.5 ± 4.4 years, $p < 0.001$), and exhibited a higher BMI (27.1 ± 4.6 vs. 26.6 ± 4.5 kg/m^2; $p = 0.015$). They also reported a greater number of children (2.0 ± 1.3 vs. 1.8 ± 1.1, $p < 0.001$), a higher prevalence of postmenopausal status (71.7% vs. 53.3%, $p < 0.001$), and higher rates of smoking, physical inactivity, psychotropic drug use, and the presence of comorbidities (all $p < 0.001$). No significant differences were observed in terms of partnership status, sexual activity, or the current use of MHT.

Regarding WRQoL (as measured with the WRQoL scale) women with severe menopausal symptoms displayed lower scores for the WRQoL tool, global and its domains (Table 2), thus indicating compromised QoL. Global score of the WRQoL tool did not significantly differ in relation to menopausal status (postmenopausal vs. premenopausal; 82.8 ± 14.2 vs 82.8 ± 14.0 points; $p = 0.95$).

Table 3 presents the scores obtained with the JSS stratified by the intensity of menopausal symptoms. Women experiencing severe symptoms reported significantly lower levels of satisfaction across all evaluated items ($p < 0.001$), with particularly more pronounced differences in some of evaluated aspects. The mean overall job satisfaction score was significantly lower in women with severe symptoms (4.48 ± 1.29 vs. 5.08 ± 1.06, $p < 0.001$). Additionally, only 40.2% of women experiencing severe symptoms considered being satisfied with their job, compared to 53.4% among those reporting absent or moderate symptoms. Unlike WRQoL, premenopausal women displayed higher total JSS scores as compared to postmenopausal women (4.93 ± 1.19 vs. 4.77 ± 1.19, $p = 0.002$).

3.1. Hierarchical linear regression – Job Satisfaction Scale (JSS)

The final model explained 13.3% of the variance in JSS scores (R^2 =

Table 1
Sociodemographic and clinical characteristics according to menopausal symptom intensity.

	Menopausal symptoms		*p* value*
	Absent to moderate	Severe	
	n = 1195 (56.3%)	*n* = 840 (43.7%)	
Age (years)	49.6 ± 5.6	51.1 ± 5.1	<0.001[1]
Years of education	15.5 ± 4.4	14.2 ± 4.9	<0.001[1]
Body mass index (kg/m^2)	26.6 ± 4.5	27.1 ± 4.6	0.015[1]
Number of children	1.8 ± 1.1	2.0 ± 1.3	<0.001[2]
Has a partner	74.0 (71.5–76.5)	75.7 (72.8–78.6)	NS
Sexually active	80.3 (78.1–82.6)	80.0 (77.3–82.7)	NS
Current MHT use	15.9 (13.8–18.0)	18.0 (15.4–20.6)	NS
Smoker	7.7 (6.2–9.2)	13.7 (11.4–16.0)	<0.001[3]
Physical inactivity	44.4 (41.6–47.3)	54.0 (57.4–50.7)	<0.001[3]
Current psychotropic drug use	14.7 (12.7–16.7)	37.6 (34.3–40.9)	<0.001[3]
Presence of comorbidities	27.3 (24.8–29.8)	44.9 (41.5–48.3)	<0.001[3]

Data are presented as mean ± standard deviation or percentages (95% confidence intervals). Severe menopausal symptoms: total MRS score of 14 or more; absent to moderate: total MRS score < 14 points. NS, non-significant; MHT, menopausal hormone therapy

* *p* value as determined with the Mann Whitney *U* test[1] or the Student's *t* test[2] or the chi-square[3].

Table 2
Scores obtained with the Work-Related Quality of Life tool according to the intensity of menopausal symptoms.

Domains of the WRQoL (higher scores better QoL)	Menopausal symptoms		*p* value*
	Absent to moderate	Severe	
	n = 1195 (56.3%)	*n* = 840 (43.7%)	
General well-being	23.2 ± 3,7	21.0 ± 4.5	<0.001[1]
Home-work interface	11.2 ± 2.6	10.1 ± 2.8	<0.001[1]
Job and career satisfaction	23.2 ± 3.7	21.6 ± 4.5	<0.001[1]
Control at work	10.9 ± 2.5	9.9 ± 2.7	<0.001[1]
Working conditions	11.8 ± 2.3	21.6 ± 4.6	<0.001[1]
Stress at work	5.5 ± 1.9	5.2 ± 1.9	<0.001[2]
Total WRQoL score	**85.8 ± 12.6**	**78.5 ± 15.0**	**<0.001[1]**

Data are presented as mean ± standard deviation. Severe menopausal symptoms: total MRS score of 14 or more; absent to moderate: total MRS score <14 points. Cronbach's alpha for the WRQoL tool was 0.922.
* *p* value as determined with the Mann Whitney *U* test[1] or the Student's *T* test[2].

0.133), with each block significantly improving model fit ($p < 0.001$). The largest incremental contribution was observed for menopausal variables ($\Delta R^2 = 0.038$).

- Sociodemographic factors accounted for 6.0% of variance, with years of education positively associated with job satisfaction ($\beta = 0.053$, $p < 0.001$) and number of children negatively associated ($\beta = -0.100$, $p < 0.001$).
- Lifestyle factors improved the model ($\Delta R^2 = 0.019$), with physical activity showing a strong positive association ($\beta = 0.291$, $p < 0.001$) and BMI a small negative association ($\beta = -0.011$, $p = 0.044$).
- Health-related factors added explanatory power ($\Delta R^2 = 0.016$), with comorbidities ($\beta = -0.276$, $p < 0.001$) and psychotropic medication use ($\beta = -0.181$, $p = 0.003$) associated with lower job satisfaction.
- Menopausal variables produced the largest improvement ($\Delta R^2 = 0.038$). Severe menopausal symptoms were the strongest negative predictor ($\beta = -0.458$, $p < 0.001$), while MHT use showed a positive association ($\beta = 0.288$, $p < 0.001$). Postmenopausal status alone was not significantly associated with JSS scores.

3.2. Hierarchical linear regression – Work-Related Quality of Life (WRQoL)

The final model explained 12.1% of the variance in WRQoL scores ($R^2 = 0.121$), with each block incrementally improving model fit. The largest increase in explained variance was again observed for menopausal variables ($\Delta R^2 = 0.044$).

- Sociodemographic and social support factors explained 4.9% of the variance. Years of education ($\beta = 0.608$, $p < 0.001$) and sexual activity ($\beta = 2.388$, $p = 0.016$) were positively associated, while age, number of children, and partnered status were not significant.
- Adding lifestyle factors increased R^2 to 0.063 ($\Delta R^2 = 0.0143$). Physical activity remained a strong positive predictor ($\beta = 3.038$, $p < 0.001$); BMI and smoking were not significant.
- The health block, including comorbidity and psychological symptoms, further increased R^2 to 0.0766 ($\Delta R^2 = 0.0134$). Comorbidity showed a negative association ($\beta = -1.406$, $p = 0.036$), and psychological symptoms had a stronger negative effect ($\beta = -3.406$, $p < 0.001$). Physical activity, education, and social support remained significant positive predictors.
- Menopausal variables produced the largest gain, raising R^2 to 0.1209 ($\Delta R^2 = 0.0443$). Severity of menopausal symptoms was the strongest negative predictor ($\beta = -6.190$, $p < 0.001$). Postmenopausal status had a positive association ($\beta = 2.109$, $p = 0.006$), while MHT use showed a non-significant positive trend ($\beta = 1.470$, $p = 0.078$). Education ($\beta = 0.494$, $p < 0.001$), physical activity ($\beta = 2.440$, $p < 0.001$), and social support ($\beta = 2.339$, $p = 0.014$) remained significant positive predictors; psychological symptoms remained a negative predictor ($\beta = -1.909$, $p = 0.008$). Comorbidity lost significance in the final step.

The most influential positive predictors of WRQoL were years of education, physical activity, and sexual activity, while the strongest negative predictors were severity of menopausal symptoms and psychological symptoms. Postmenopausal status and potentially MHT use were associated with higher WRQoL after full adjustment.

A sensitivity analysis was conducted using a dichotomised WRQoL outcome and redefining menopausal symptom severity based solely on items 1 and 10 of the MRS. In this logistic regression model, the association remained statistically significant. Compared with the primary

Table 3
Job Satisfaction Scale (JSS) scores and percentage of satisfaction per item according to the intensity of menopausal symptoms.

Items of the JSS	Menopausal symptoms				*p* value*	
	Absent to moderate		Severe		A	B
	n = 1195		*n* = 840			
	Mean ± SD	(%)	Mean ± SD (%)	(%)		
1. Physical working conditions	5.33 ± 1.46	(76.6)	4.51 ± 1.72	(56.2)	<0.001[1]	<0.001[3]
2. Freedom to choose working methods	5.13 ± 1.49	(70.8)	4.32 ± 1.78	(49.4)	<0.001[1]	<0.001[3]
3. Your colleagues and fellow workers	5.28 ± 1.35	(75.1)	4.81 ± 1.57	(60.0)	<0.001[1]	<0.001[3]
4. Recognition for the quality of work	4.87 ± 1.60	(62.2)	4.41 ± 1.59	(50.7)	<0.001[2]	<0.001[3]
5. Your immediate boss	4.98 ± 1.52	(62.8)	4.62 ± 1.58	(55.5)	<0.001[2]	<0.001[3]
6. The responsibility you are given	5.40 ± 1.34	(79.6)	4.79 ± 1.51	(61.7)	<0.001[1]	<0.001[3]
7. Your rate of pay	4.67 ± 1.72	(62.7)	4.08 ± 1.80	(46.5)	<0.001[1]	<0.001[3]
8. The opportunity to use your abilities	5.18 ± 1.44	(73.7)	4.59 ± 1.63	(57.6)	<0.001[1]	<0.001[3]
9. Company-employee relationship	4.99 ± 1.48	(67.2)	4.48 ± 1.67	(53.8)	<0.001[1]	<0.001[3]
10. Your chance of promotion	4.61 ± 1.53	(53.6)	3.98 ± 1.69	(40.4)	<0.001[1]	<0.001[3]
11. The way your firm is managed	4.74 ± 1.50	(59.2)	4.09 ± 1.65	(43.8)	<0.001[1]	<0.001[3]
12. Receiving your suggestions	4.92 ± 1.51	(64.4)	4.35 ± 1.69	(49.3)	<0.001[1]	<0.001[3]
13. Your hours of work	5.26 ± 1.47	(74.0)	4.59 ± 1.69	(57.7)	<0.001[1]	<0.001[3]
14. The amount of variety in your job	5.18 ± 1.38	(71.8)	4.56 ± 1.62	(57.3)	<0.001[1]	<0.001[3]
15. Your employment stability	5.64 ± 1.35	(80.7)	5.01 ± 1.75	(69.3)	<0.001[1]	<0.001[3]
Global job satisfaction (Total JSS score)	**5.08 ± 1.06**	**(53.4)**	**4.48 ± 1.29**	**(40.2)**	**<0.001[1]**	**<0.001[3]**

Data are presented as mean ± standard deviation and percentage of satisfaction (% of those scoring a mean of 5 or more). Severe menopausal symptoms: total MRS score of 14 or more; absent to moderate: total MRS score < 14 points. Cronbach's alpha for the JSS was 0.916.
* *p* value as determined with the Mann Whitney *U* test[1] or the Student's *t* test[2] (Column A) or the chi-square test[3] (Column B).

hierarchical linear model, the alternative specification explained slightly more variance (Nagelkerke $R^2 = 0.128$ vs. 0.117) and demonstrated improved model fit (−2 Log Likelihood 2614.7 vs. 2629). Adjusted odds ratios were 4.48 (95% CI 3.18–6.31) for mild symptoms and 2.52 (95% CI 1.84–3.45) for severe symptoms (reference: none).

4. Discussion

The present study reveals a significant association between severe menopausal symptoms and impaired occupational well-being among midlife women. Women experiencing severe symptoms exhibited significantly lower job satisfaction and poorer WRQoL, even after adjustment for potential confounders, including sociodemographic, lifestyle, health-related, and menopausal factors. This association were further supported by a sensitivity analysis using items 1 and 10 of the MRS, which yielded consistent results and slightly improved model fit.

Recent evidence has questioned the exclusive reliance on menstrual cycle criteria to define the menopausal transition [25]. Although menopausal status in our study was classified according to STRAW+10 criteria, staging was not the main explanatory variable. Postmenopausal status per se was not consistently associated with WRQoL or job satisfaction after adjustment, whereas the severity of menopausal symptoms emerged as the strongest predictor of occupational outcomes. These findings suggest that symptom burden may be more relevant than menstrual staging when evaluating work-related wellbeing in midlife women. Women without menstruation due to non-menopausal causes were excluded, minimising potential misclassification.

The results align with previous evidence highlighting the adverse impact of menopausal symptoms on women's functioning in the workplace and their overall productivity. Hardy et al. [26] did not find an association between menopause status and work outcomes; however, having problematic hot flushes at work was linked to the intention to stop working [26]. Similarly, Jack et al. [27] noted in their review that several studies have reported a negative impact of vasomotor and related symptoms on women's productivity, work capacity, and overall work experience. However, they also highlighted that these findings are inconsistent across all studies [27].

Regarding WRQoL, our findings suggest that women experiencing severe menopausal symptoms report lower levels of general well-being, career satisfaction, job control, and working conditions, along with a poorer work–life balance. These domains represent core components of WRQoL and align with the framework proposed by Easton and Van Laar [19] in their validation of the WRQoL scale, which highlights the multidimensional influence of the work environment on both psychological and functional aspects of well-being. These findings support earlier qualitative and quantitative studies reporting the fact that menopausal symptoms interfere with work performance, resulting in reduced concentration, increased absenteeism, and impaired interpersonal relations in the workplace [28]. Importantly, our findings quantify this impact through validated psychometric scales, reinforcing the argument for targeted interventions.

In terms of job satisfaction, our results show that women with severe symptoms reported lower job satisfaction in critical areas such as autonomy, recognition, salary, promotion opportunities, and job stability. These results are consistent with previous studies that have identified the menopausal transition as a vulnerable period for aged working women, especially in occupations that require high levels of social interaction or demanding physical conditions [29,30].

When examining the specific impact of menopausal status on occupational well-being, we found no significant differences in total WRQoL scores between postmenopausal and premenopausal women. However, a statistically significant difference was observed in terms of overall job satisfaction, favouring premenopausal women. The lack of differences observed in WRQoL in relation to menopausal status indicates that status, per se, does not significantly influence overall perceptions of WRQoL. This could likely reflect the stability of structural aspects of work, such as working conditions, control, interpersonal relationships, and work-life balance, which may remain relatively unaffected regardless of hormonal status. In other words, postmenopausal women appear to maintain similar functional satisfaction with their work environment despite biological changes. In line with our findings, a review of 10 studies concluded that menopausal status was not consistently associated with work ability [31].

In contrast to WRQoL, the observed difference in job satisfaction indicates a slightly lower subjective sense of satisfaction among postmenopausal women. While the magnitude of this effect is modest, it may have significant implications over time, particularly if compounded by other factors such as symptom burden, job demands, or perceived ageing. Several explanations may account for this situation, including greater vitality or emotional resilience during the premenopausal phase, lower cumulative exposure to occupational stress, or the influence of menopausal symptoms, such as vasomotor disturbances, sleep disruption, or fatigue, which, although not significantly affecting WRQoL, may negatively impact the emotional appraisal of one's experience job.

It is therefore essential to recognise the conceptual distinction between the two instruments used in the present research. The WRQoL scale evaluates broad and functional aspects of occupational well-being, including general well-being, working conditions, perceived control, and stress levels [19]. In contrast, the JSS captures a more affective and summarised evaluation of job satisfaction, which may be more sensitive to subjective and emotional factors [22]. Consequently, while menopausal status may not negatively influence the structural or functional components of working life, it may still affect how women emotionally appraise or derive fulfilment from their professional roles. This distinction may explain why the WRQoL scores remained stable across menopausal groups, whereas the significant decline was observed in overall job satisfaction among postmenopausal women.

These findings suggest that although menopause does not appear to significantly alter WRQoL in a functional sense, it is associated with a decrease in overall job satisfaction. This highlights the potential importance of developing workplace interventions aimed at supporting the emotional well-being of postmenopausal women in the professional environment. Our results further reinforce the notion that untreated or unaddressed menopausal symptoms may contribute to gender inequities in the workforce, particularly when these symptoms coincide with professional responsibilities at the peak of a woman's career.

The findings of this study indicate that both job satisfaction and WRQoL are shaped by a multidimensional interplay of sociodemographic, lifestyle, health-related, and menopausal factors. Hierarchical linear regression models demonstrated progressive improvements in explanatory power as successive blocks of variables were added. Although the proportion of variance explained by the final models was modest (13.3% for JSS and 12.1% for WRQoL), these values are consistent with expectations for psychosocial outcomes, which are inherently influenced by complex and interacting determinants. Importantly, menopausal variables produced the largest incremental contribution in both models, highlighting the substantial role of menopausal health in shaping women's experiences in the workplace.

The menopause-related block yielded the largest improvement in model performance for both outcomes. Severity of menopausal symptoms emerged as the strongest negative predictor across models, reinforcing prior evidence that vasomotor, psychological, and somatic symptoms interfere with concentration, energy, productivity, and emotional regulation in the workplace [32]. This finding has important public health implications, as inadequately managed menopausal symptoms may contribute to reduced productivity, increased absenteeism, and eventual labour market withdrawal among midlife women. However, the persistence of severe symptoms among some MHT users may appear paradoxical. This likely reflects confounding by indication, as women with more severe symptoms are more likely to seek treatment. In addition, factors such as timing of initiation, dosage, adherence, and individual variability in response may contribute to persistent symptoms

despite therapy. Given the observational nature of the study, causal inferences cannot be made, and residual confounding, including health-seeking behaviour, may partly explain these associations.

Notably, postmenopausal status per se was not associated with job satisfaction and showed a positive association with WRQoL after adjustment for symptom severity. This suggests that it is not the menopausal stage itself, but rather the burden of symptoms, that primarily drives adverse work-related outcomes. It is important to acknowledge that the MRS captures both vasomotor and non-specific symptoms, including mood disturbances, sleep problems, and physical and mental exhaustion. Many of these complaints may be influenced not only by hormonal changes but also by psychosocial and mid-life contextual factors. Therefore, the associations observed in this study likely reflect the overall symptomatic burden experienced by women during mid-life rather than exclusively oestrogen-deficiency–related symptoms. The positive association observed between MHT use and job satisfaction, together with a positive (although non-significant) trend for WRQoL, is consistent with evidence indicating that MHT use can effectively alleviate menopausal symptoms, particularly vasomotor and sleep-related disturbances [33]. Given the observational nature of the study, causal inferences cannot be made, and residual confounding, including health-seeking behaviour, may partly explain these associations.

Across models, educational attainment emerged as a robust positive predictor of both job satisfaction and WRQoL. This may be explained by improved access to higher-quality employment, greater income, job autonomy, and job satisfaction variety [34]; and increased knowledge concerning the management of menopausal symptoms and available therapeutic options [33]. Conversely, the number of children was negatively associated with job satisfaction, suggesting that competing demands between work and family may reduce perceived work satisfaction, a pattern documented in international literature on work–family conflict [35].

Physical activity was an important lifestyle factor associated with higher job satisfaction and better WRQoL in both models. This finding aligns with evidence showing that regular exercise is linked to improved mental health, sleep quality, and overall well-being, which may be reflected in more positive perceptions of the work environment [36].

Associations between BMI and job satisfaction were statistically significant but small, while BMI was not significantly related to WRQoL. These mixed findings suggest that body weight may influence occupational outcomes indirectly, through general health status or psychosocial pathways, rather than exerting a direct effect on work-related well-being [37].

Health-related variables showed consistent inverse associations with occupational well-being. Comorbidities and psychological symptoms, as well as psychotropic medication use, were associated with lower job satisfaction and poorer WRQoL, particularly in the intermediate steps of the models. The attenuation of the association between comorbidities and WRQoL in the final model suggests that menopausal symptom severity may mediate or outweigh the contribution of chronic physical conditions when explaining women's functioning in the workplace. Sexual activity was associated with more favourable work-related outcomes. Regular sexual activity has been shown to stimulate the release of neurotransmitters and hormones such as dopamine, oxytocin, and endorphins, which play a fundamental role in mood regulation, stress reduction, and the promotion of neuroplasticity [38]. These neurobiological effects may contribute to improved cognitive function and enhance work performance and capacity.

Taken together, these findings indicate that workplace well-being in midlife women is influenced by a combination of structural factors (such as education), behavioural factors (notably physical activity), overall health status, and menopausal experiences. Among these, the severity of menopausal symptoms appears to play a central and clinically meaningful role, exceeding the contribution of sociodemographic or lifestyle factors alone. These results underscore the importance of organisational policies and clinical strategies that recognise and address menopausal symptoms as a means of maintaining and improving women's occupational well-being.

Future research should further explore potential causal pathways and underlying mechanisms, including the role of mediators such as sleep quality and workplace support, preferably using longitudinal study designs. Given the relatively modest proportion of variance explained by the current models, future investigations should also incorporate additional workplace, organisational, and psychosocial factors—such as job demands, perceived discrimination, and managerial support—to achieve a more comprehensive understanding of the determinants of job satisfaction and WRQoL during the menopausal transition.

4.1. Strengths and limitations

A key strength of this study is the use of hierarchical linear regression, which enabled a systematic examination of the incremental contribution of sociodemographic, lifestyle, health-related, and menopausal variables to job satisfaction and WRQoL. This analytical approach offers a nuanced understanding of how different domains contribute to work-related outcomes and highlights the distinct and substantial role of menopausal symptom severity. Additional strengths include the relatively large sample size and the use of validated instruments to assess menopausal symptoms, psychological health, and occupational well-being, enhancing internal validity and facilitating comparison with existing literature.

Several limitations should also be acknowledged. First, the cross-sectional design precludes causal inference and limits the ability to examine temporal relationships between predictors and work-related outcomes; longitudinal studies are therefore warranted, particularly to capture changes across the menopausal transition. Second, both exposures and outcomes were assessed using self-reported measures, which may be subject to reporting biases, including recall or social desirability bias. Third, although a broad range of relevant variables was included, the proportion of variance explained by the models was modest, indicating that additional organisational, psychosocial, and occupational factors—such as job demands, workplace culture, or managerial support—were not captured and may also play an important role. Fourth, the absence of objective clinical measures for comorbidities or psychological symptoms may have resulted in misclassification or underestimation of health-related predictors. Finally, as the study sample was drawn from a specific population context, the generalisability of the findings to other cultural or labour environments may be limited.

The markedly higher prevalence of psychotropic drug use among women with severe menopausal complaints warrants consideration. Previous research from our group has shown that severe menopausal symptoms are independently associated with the use of psychotropic medication, particularly antidepressants [39]. This likely reflects the close link between vasomotor symptoms, mood disturbances and anxiety during the menopausal transition. In this context, psychotropic drug use may be better understood as a marker of greater symptom burden and psychological vulnerability rather than as a direct cause of impaired job satisfaction. Nonetheless, its potential confounding role should be considered when interpreting the associations between symptom severity and work-related outcomes.

Finally, the sample was not intended to be representative of all midlife women in Latin America, as it was deliberately restricted to women in formal, salaried employment who attended routine gynaecological care and self-identified as being in generally good health. This selection may limit the generalisability of our findings, particularly for women working in informal sectors or those with significant health conditions. However, this methodological choice also strengthens internal validity by reducing heterogeneity in work environments and enabling a more consistent assessment of job satisfaction and WRQoL. Moreover, focusing on dependent workers provides policy-relevant evidence for a population exposed to structured psychosocial work

demands during the menopausal transition.

Despite these limitations, this study provides meaningful insights into the multifactorial determinants of occupational well-being in midlife women and underscores the relevance of menopausal health as an important consideration in the workplace.

5. Conclusion

In conclusion, our findings highlight a significant association between severe menopausal symptoms and lower job satisfaction as well as poorer WRQoL among midlife women in Latin America. These results underscore the importance of recognising menopausal symptom burden as a relevant factor in women's occupational well-being. Addressing menopausal symptoms through appropriate clinical care, supportive workplace policies, and targeted educational initiatives may contribute to improved health and work-related outcomes during midlife.

Contributors

María S. Vallejo contributed to study conception and design, drafting the article and revising it critically for important intellectual content.

Juan E. Blümel contributed to study conception and design, statistical analysis, drafting the article and revising it critically for important intellectual content.

Peter Chedraui contributed to study conception and design, statistical analysis, drafting the article and revising it critically for important intellectual content.

Juan Matsumura-Kasana, Paolo Meza, Álvaro Monterrosa-Castro, Mónica Ñañez, Marcela López, Eliana Ojeda, Claudia Rey,

Ana Lucia Ribeiro Valadares,

Doris Rodríguez-Vidal,

Marcio AH. Rodrigues,

Javier Saavedra,

Carlos Salinas, and Lida Sosa contributed to data acquisition and revision of text for important intellectual content.

Konstantinos Tserotas contributed to study conception and design, data acquisition, and revision of text for important intellectual content.

Margot Acuña-San Martín, Marcela S. Aguirre, Eugenio Arteaga, Félix Ayala, Ascanio Bencosme, Andrés Calle, Lucia Costa-Paiva, Maribel Dextre, Karen Díaz, Alejandra Elizalde-Cremonte, Santiago Elizalde-Cremonte, and Carlos Escalante contributed to data acquisition and revision of text for important intellectual content.

María T. Espinoza contributed to study conception and design, data acquisition, and revision of text for important intellectual content.

Ircania García, Gustavo Gómez-Tabares, and Hugo Gutiérrez-Crespo contributed to data acquisition and revision of text for important intellectual content.

All authors saw and approved the final version and no other person made a substantial contribution to the paper.

Ethical approval

The study protocol for this research was reviewed and approved by the Ethics Committee of the University of Cartagena (178-26-11-24-1-1), Cartagena, Colombia, and adheres to the principles of the Declaration of Helsinki. Prior to participation, all participants were informed about the aims and procedures of the study, after which they provided written informed consent.

Provenance and peer review

This article was not commissioned and was externally peer reviewed.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work the authors used Grammarly in order to correct points of grammar and style in the English translation of the Spanish draft. After using Grammarly, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

Funding

No specific grant from any public, commercial, or non-for-profit agency was provided for the execution of this research.

Data sharing and collaboration

There are no linked research data sets for this article. The data from this study are not publicly available but can be obtained upon reasonable request for research collaboration projects, subject to consideration of ethical, privacy, and legislative requirements.

Declaration of competing interest

The authors declare that they have no competing interest.

References

[1] International Labour Organization, 117 million women form part of the labour force in Latin America and the Caribbean. 8 March 2018, Available at: https://www.ilo.org/resource/news/117-million-women-form-part-labour-force-latin-america-and-caribbean, 2026.

[2] Our World in Data, E. Ortiz-Ospina, S. Tzvetkova, M. Roser, Women's employment, Available at: https://ourworldindata.org/female-labor-supply, March 2024.

[3] United Nations, Progress on the Sustainable Development Goals: The Gender Snapshot 2023, UN Women and UN DESA, New York, 2023. https://www.unwomen.org/en/digital-library/publications/2023/09/progress-on-the-sustainable-development-goals-the-gender-snapshot-2023.

[4] F. Mauvais-Jarvis, N. Bairey Merz, P.J. Barnes, R.D. Brinton, J.J. Carrero, D. L. DeMeo, et al., Sex and gender: modifiers of health, disease, and medicine, Lancet 396 (10250) (2020) 565–582, https://doi.org/10.1016/S0140-6736(20)31561-0.

[5] H.P. Schneider, A.H. Maclennan, D. Feeny, Assessment of health-related quality of life in menopause and aging, Climacteric 11 (2) (2008) 93–107, https://doi.org/10.1080/13697130801936739.

[6] S.B. Doshi, A. Agarwal, The role of oxidative stress in menopause, J. Midlife Health. 4 (3) (2013) 140–146, https://doi.org/10.4103/0976-7800.118990.

[7] World Bank Group, D. Halim, M.B. O'Sullivan, A. Sahay, El aumento de la participación de la mujer en la fuerza laboral. https://documents1.worldbank.org/curated/en/099556508022327941/pdf/IDU1f62b5ad31c0ab14e2e1a0671b131e7e42de9.pdf, January 2023.

[8] P. Chedraui, J.E. Blümel, G. Baron, E. Belzares, A. Bencosme, A. Calle, et al., Impaired quality of life among middle aged women: a multicentre Latin American study, Maturitas 61 (4) (2008) 323–329, https://doi.org/10.1016/j.maturitas.2008.09.026.

[9] C.A. Stuenkel, Vasomotor and related menopause symptoms, Clin. Obstet. Gynecol. 61 (3) (2018) 433–446, https://doi.org/10.1097/GRF.0000000000000385.

[10] P. Briggs, C. Dinkel-Keuthage, J. Nguyen, N. Schoof, C. Moeller, K.R. Bolling, et al., The burden of sleep disturbances and vasomotor symptoms on work productivity, activity impairment and healthcare resource use in perimenopausal and postmenopausal women, Maturitas 203 (2025) 108758, https://doi.org/10.1016/j.maturitas.2025.108758.

[11] M. Ben Natan, Menopause symptoms are common and linked to reduced work ability in Finnish registered nurses, Evid Based Nurs (2025) ebnurs-2025-104453, https://doi.org/10.1136/ebnurs-2025-104453.

[12] E. Alzueta, L. Menghini, L. Volpe, F.C. Baker, A. Garnier, P.M. Sarrel, et al., Navigating menopause at work: a preliminary study about challenges and support systems, Menopause 31 (4) (2024) 258–265, https://doi.org/10.1097/GME.0000000000002333.

[13] N.E. Avis, R. Stellato, S. Crawford, J. Bromberger, P. Ganz, V. Cain, M. Kagawa-Singer, Is there a menopausal syndrome? Menopausal status and symptoms across racial/ethnic groups, Soc. Sci. Med. 52 (3) (2001) 345–356, https://doi.org/10.1016/s0277-9536(00)00147-7.

[14] K. Tserotas, J.E. Blümel, P. Chedraui, M.S. Vallejo, M. Ñañez, E. Ojeda, et al., Association of menopausal symptoms on work performance in midlife Latin American women, Menopause 33 (3) (2026) 333–339, https://doi.org/10.1097/GME.0000000000002645.

[15] S.D. Harlow, M. Gass, J.E. Hall, R. Lobo, P. Maki, R.W. Rebar, et al., Executive summary of the Stages of Reproductive Aging Workshop + 10: addressing the

unfinished agenda of staging reproductive aging, J. Clin. Endocrinol. Metab. 97 (4) (2012) 1159–1168, https://doi.org/10.1210/jc.2011-3362.
[16] J.E. Blümel, E. Arteaga, J. Parra, C. Monsalve, V. Reyes, M.S. Vallejo, et al., Decision-making for the treatment of climacteric symptoms using the Menopause Rating Scale, Maturitas 111 (2018) 15–19, https://doi.org/10.1016/j.maturitas.2018.02.010.
[17] Zentrum für Epidemiologie und Gesundheitsforschung (ZEG Berlin), in: Menopause Rating Scale in Spanish, 2025. Available at: https://zeg-berlin.de/wp-content/uploads/2017/01/MRS_Spanish.pdf.
[18] Zentrum für Epidemiologie und Gesundheitsforschung (ZEG Berlin), in: Menopause Rating Scale in Portuguese (Brazil), 2025. Available at: https://zeg-berlin.de/wp-content/uploads/2017/01/MRS_Brazil.pdf.
[19] S. Easton, D. Van Laar, User Manual for the Work-Related Quality of Life (WRQoL) Scale: A Measure of Quality of Working Life, 2nd edition, University of Portsmouth, 2018. https://researchportal.port.ac.uk/en/publications/user-manual-for-the-work-related-quality-of-life-wrqol-scale-a-me.
[20] Quality of working life. Work-Related Quality of Life Scale. 2012. Available at: https://www.wrqol.com/researchers/WRQoL%20QNR%20v23%20spanish%20v2%20may12.pdf.
[21] Quality of working life. Work-Related Quality of Life Scale. 2012. Escala da Qualidade de Vida Relacionada com o Trabalho. Available at: https://www.wrqol.com/researchers/Escala%20QVT.pdf.
[22] P. Warr, J. Cook, T. Wall, Scales for the measurement of some work attitudes and aspects of psychological well-being, J. Occup. Org. Psych. 52 (2) (1979) 129–148, https://doi.org/10.1111/j.2044-8325.1979.tb00448.x.
[23] A. Boluarte, Propiedades psicométricas de la Escala de satisfacción laboral de Warr, Cook y Wall, versión en español, Rev. Med. Hered. 25 (2) (2014) 80–84.
[24] Dos Santos JV, Sousa C, Gonçalves G. Job Satisfaction Scale of Warr, Cook and Wall (1979): The psychometric properties of the Portuguese version. 2022. Available at: https://www.researchgate.net/publication/362482496_Job_Satisfaction_Scale_of_Warr_Cook_and_Wall_1979_The_psychometric_properties_of_the_Portuguese_version.
[25] R.M. Islam, M. Bond, A. Ghalebeigi, Y. Wang, K. Walker-Bone, S.R. Davis, Prevalence and severity of symptoms across the menopause transition: cross-sectional findings from the Australian Women's Midlife Years (AMY) Study, Lancet Diabetes Endocrinol. 13 (9) (2025) 765–776, https://doi.org/10.1016/S2213-8587(25)00138-X.
[26] C. Hardy, E. Thorne, A. Griffiths, M.S. Hunter, Work outcomes in midlife women: the impact of menopause, work stress and working environment, Womens Midlife Health. 4 (2018) 3, https://doi.org/10.1186/s40695-018-0036-z.
[27] G. Jack, K. Riach, E. Bariola, M. Pitts, J. Schapper, P. Sarrel, Menopause in the workplace: what employers should be doing, Maturitas 85 (2016) 88–95, https://doi.org/10.1016/j.maturitas.2015.12.006.
[28] M. Geukes, M.P. van Aalst, M.C. Nauta, H. Oosterhof, The impact of menopausal symptoms on work ability, Menopause 19 (3) (2012) 278–282, https://doi.org/10.1097/gme.0b013e31822ddc97.
[29] P. Gartoulla, R.J. Bell, R. Worsley, S.R. Davis, Menopausal vasomotor symptoms are associated with poor self-assessed work ability, Maturitas 87 (2016) 33–39, https://doi.org/10.1016/j.maturitas.2016.02.003.
[30] J. Whiteley, J.S. Wagner, A. Bushmakin, L. Kopenhafer, M. Dibonaventura, J. Racketa, Impact of the severity of vasomotor symptoms on health status, resource use, and productivity, Menopause 20 (5) (2013) 518–524, https://doi.org/10.1097/GME.0b013e31827d38a5.
[31] S. Taylor, B. Callahan, J. Grant, R.M. Islam, S.R. Davis, Menopause and work performance: a systematic review of observational studies, Menopause (Jun 3 2025), https://doi.org/10.1097/GME.0000000000002557.
[32] P. Verdonk, E. Bendien, Y. Appelman, Menopause and work: a narrative literature review about menopause, work and health, Work 72 (2) (2022) 483–496, https://doi.org/10.3233/WOR-205214.
[33] "The 2022 Hormone Therapy Position Statement of The North American Menopause Society" Advisory Panel. The 2022 hormone therapy position statement of The North American Menopause Society. Menopause. 2022;29(7): 767–794. doi:https://doi.org/10.1097/GME.0000000000002028.
[34] B.C. Solomon, B.N. Nikolaev, D.A. Shepherd, Does educational attainment promote job satisfaction? The bittersweet trade-offs between job resources, demands, and stress, J. Appl. Psychol. 107 (7) (2022) 1227–1241, https://doi.org/10.1037/apl0000904.
[35] M. AlAzzam, R.F. AbuAlRub, A.H. Nazzal, The relationship between work-family conflict and job satisfaction among hospital nurses, Nurs. Forum 52 (4) (2017) 278–288, https://doi.org/10.1111/nuf.12199.
[36] S. Heuse, B. Gekeler, D. Fodor, The role of physical exercise as a personal resource against job stress, Int. J. Occup. Saf. Ergon. 27 (4) (2021) 1251–1260, https://doi.org/10.1080/10803548.2020.1732648.
[37] A. Hruby, F.B. Hu, The epidemiology of obesity: a big picture, Pharmacoeconomics 33 (7) (2015) 673–689, https://doi.org/10.1007/s40273-014-0243-x.
[38] H. Wright, R.A. Jenks, Sex on the brain! Associations between sexual activity and cognitive function in older age, Age Ageing 45 (2) (2016) 313–317, https://doi.org/10.1093/ageing/afv197.
[39] F. Ayala, J.E. Blümel, M.S. Vallejo, P. Chedraui, H. Gutiérrez-Crespo, M. López, et al., Physical activity as an alternative or adjunct to menopausal hormone therapy for symptom management in women with primary ovarian insufficiency, Maturitas 206 (2026) 108855, https://doi.org/10.1016/j.maturitas.2026.108855.