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# Association between menopause and occupational burnout in healthcare workers: a cross-sectional study

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## ABSTRACT

The increased proportion of women in the workplace and the labor force aging have been demanding investigations of the link between menopause and occupational health issues, especially in healthcare settings. Evidence on the association between menopause and occupational burnout in healthcare settings is still inconclusive. Therefore, we aimed to evaluate the association between menopause and burnout among clinical and non-clinical workers in different occupational health environments. A multi-center, cross-sectional study, applying the Oldenburg Burnout Inventory (OBI) was conducted from September 2021 to March 2023 in University Medical Center (UMC) hospitals in Astana, Kazakhstan. The study involved 125 physicians and nurses and 82 non-clinical administrative and service staff. We found that 63.9% of respondents had disengagement and 61.7% had exhaustion. The affiliated clinical setting was associated with disengagement ( $p = 0.034$ ), with the highest prevalence among employees in surgical departments (76.9%), while a higher prevalence of exhaustion was found in individuals with different work experience ( $p = 0.023$ ) and among those who were dissatisfied with their work environment (74.3%). While burnout was identified in almost two-thirds of respondents, the self-reported menopause status of participants was not significantly related to either disengagement ( $p = 0.34$ ) or exhaustion ( $p = 0.73$ ), even though a higher prevalence of both was revealed among the postmenopausal group. We propose that healthcare management should understand the importance of burnout among postmenopausal healthcare workers and facilitate open communication and a supportive work environment.

## ARTICLE HISTORY

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## KEYWORDS

Menopause; burnout; healthcare workers; exhaustion; disengagement

## Introduction

Women present a substantial segment of workforce and a significant proportion of them are actively engaged during their menopausal years (Viotti et al., 2021). As menopause was found to negatively affect job demands, work ability and productivity, current investigations are focused to highlight the

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complex relationship between menopause and work-related health issues, especially occupational burnout (Coco et al., 2023; Dotlic et al., 2018; Gazibara et al., 2019; Nomura et al., 2024; Oude Hengel et al., 2023).

Burnout is characterized as a multifaceted psychological phenomenon and an internal emotional reaction to external stressors, marked by various symptoms such as diminished personal achievement, feelings of guilt, and job-related anxiety (Guidetti et al., 2018). Assessment of burnout includes distinguishing between two core factors of disengagement and exhaustion (Demerouti et al., 2003). In healthcare providers, menopausal symptoms were found to be associated with burnout, especially emotional exhaustion (Converso et al., 2019).

The recent study from US reported that the prevalence of burnout among physicians was almost doubled after the onset of COVID-19 pandemic, from 38.2% in 2020 to 62.8% in 2021 (Shanafelt et al., 2022). Although burnout has been exacerbated by the pandemic, it has been around during pre-COVID-19 era, affecting clinical and non-clinical healthcare workers.

It is widely accepted that the emotionally demanding interactions between healthcare workers and patients are the primary risk for occupational burnout (Browning, 2019). Most studies indicate that menopause affects cognitive function due to depleted oestrogen (Adhikaree et al., 2023; Weber et al., 2014). Oestrogens act in areas of the central nervous system that control learning, registering, and retrieving information, judgement, evaluation processes and language skills (Davis et al., 2015). High levels of responsibility that require exceptional physical and cognitive as well as emotional resources, increased work-related stress, unpredictability, and exposure to potentially traumatic situations makes health professional prone to burnout (Sfregola et al., 2017). The recent study also found patients treated by burned-out physicians face additional risks when they receive care (Shanafelt et al., 2022).

In addition to existing job-related stress, menopause in healthcare workers contributes to irritability, decreased energy and concentration loss at work which also negatively affect professional work-related issues (Hardy et al., 2018). The increased proportion of women in a workplace and the labor force aging have been demanding the investigations of the link between menopause and occupational health issues, especially in healthcare settings.

Recently published data found that emotional exhaustion and depersonalization were affected differently by menopausal symptoms (Converso et al., 2019). Menopausal symptoms tend to activate a process of energy depletion, which might lead menopausal women feeling exhausted at work. However, depersonalization was affected by menopausal symptoms only among women who reported low social support (from superiors and colleagues), optimism, and resilience (Converso et al., 2019). Considering the fact that only a few studies investigated the relationship between menopause and occupational burnout among healthcare workers (Converso et al., 2019), our research aims to expand knowledge on this topic.

In our previous study, we investigated the role of the work environment on the quality of life of menopausal physicians and nurses and the impact of menopausal status on the quality of life in healthcare workers (Bapayeva et al., 2023; Terzic et al., 2024).

Currently, we aimed to evaluate the association between menopause and burnout among clinical and non-clinical workers in different occupational health environments.

## Methods

### *Study design and data collection*

A multi-center cross-sectional study was conducted in compliance to the STROBE guideline in four hospitals of Nazarbayev University (NU) Medicine clinical settings (Kazakhstan) throughout the period of September 2021 to March 2023. A survey was conducted in four hospitals within the University Medical Center (UMC) in Astana and Kyzylorda, utilizing a self-administered questionnaire. Clinics involved in the study were the National Scientific Center for Mother and Child (NRCMC), the

Republican Diagnostic Center (RDC), and the National Center for Children's Rehabilitation (NCCR), Kazakhstan.

In this study, the following inclusion criteria were applied: (1) female gender; (2) age 40 years and older; (3) healthcare workers employed at NU Medicine. Exclusion criteria were: (1) women with serious health problems (such as severe chronic diseases, including psychological or psychiatric comorbidities); (2) women with premature ovarian failure or menopause caused by surgery, chemo or radiotherapy; (3) women receiving hormone replacement therapy. Primary ovarian insufficiency (POI) is the onset of menopause before the age of 40 years (Gatenby & Simpson, 2024). Hormone replacement therapy provides optimal management of some menopausal symptoms (Cameron et al., 2024). Therefore, it will confound the relationship between menopause and burnout.

Healthcare workers obtained an invitation to participate in the study through email invitation. Those who agreed to participate then received the informed consent form and a questionnaire. Voluntary participation was ensured, and healthcare workers may opt to discontinue the survey at any stage.

### **Study instrument**

Questionnaires were distributed to employees meeting the inclusion criteria ( $N = 750$ ). Employees agreeing to participate ( $N = 477$ ) responded to a self-administrated survey. The questionnaire included socio-demographic information (i.e. age, job specifics, job seniority) and sub-scales for measuring study variables (i.e. menopausal status, social and personal resources, burnout, and workability). The occupational health environment is deemed to deviate depending on the departmental affiliation of healthcare workers. Thus, data on departments where participants were working was collected and categorized into three groups – surgical, therapeutic departments, and other, which included administration, laboratory, pathology, genetics, and radiology departments.

Burnout was evaluated across its two core dimensions (disengagement and exhaustion) using the Oldenburg Burnout Inventory (OBI). Given instrument includes 16 items describing the states of emotional exhaustion and disengagement and was developed to meet different occupational groups [21]. The degree of agreement with 16 items of OBI uses a 4-point Likert scale ranging from 'Strongly disagree' to 'Strongly agree' with 4 points for the highest burnout response and 1 point for the lowest. In the bivariate and stratified analysis, disengagement and exhaustion scores were categorized using the cut-offs of 2.1 and 2.25, respectively (Tan et al., 2020).

The OBI survey has been validated by many studies (Sinval et al., 2019; Tan et al., 2020). Recently published study (Mahadi et al., 2018) confirmed that the OBI survey possessed an adequate face validity, good internal consistency, and construct validity by using confirmatory factor analysis. The survey was conducted in Kazakh and Russian languages depending on the participants' preferences. The OBI survey passed through cross-cultural adaptation according to the requirements (Beaton et al., 2000; Hilton & Skrutkowski, 2002) and was translated and back-translated into Kazakh and Russian languages with the assistance of independent trilingual (English-Russian-Kazakh) interpreters. The process of the translation consisted of five stages: direct translation, synthesis of the translation, back translation, expert review, and testing of the translated and adapted version. The cross-culturally adapted Kazakh and Russian versions of the questionnaire were validated by a pilot survey among 20 participants to evaluate the clarity.

Self-reported menopause status (pre-, post-menopause) was used for the analysis of the association between menopause and burnout. Pre-menopause was defined as any period before an event of having 12 months of complete amenorrhea in women older than 45 years. Post-menopause was defined as the period after this event. The quality of the working environment was assessed by National Health Service in England and Wales as a baseline data – gathering method at UK hospitals (Menopause and the workplace survey results, 2022). This questionnaire includes questions describing working conditions, work environment, and job satisfaction.

## **Ethical approval**

The study was conducted in compliance with the Helsinki Declaration and approved by the University Medical Center Institutional Research Ethics Board on 28 December 2020, protocol #2. This study is a part of the project entitled: *'Menopausal symptoms and burnout: Comparison of Occupational health issue among health professionals in university hospitals of University Medical Center in Astana'*. The data collected were anonymized and did not contain personal data that could lead to identification of respondents. Each individual enrolled in this study provided written informed consent. No remuneration was offered to the patients to give consent to be enrolled in this study.

## **Statistical analysis**

In the descriptive analysis, frequencies, and percentages were used to summarize categorical variables. Continuous variables were summarized with mean and standard deviations. The association between binary categorical independent variables and outcomes was investigated using Pearson's Chi-squared test for independence. The bivariate analysis of association between participants' age and the burnout outcomes was conducted using an Independent Two-sample T-test. The assumptions concerning the normality of distributions, equality of variances and independence were checked for the mentioned statistical tests. In cases of assumptions' violation, non-parametric alternatives were considered for usage, namely the Mann-Whitney U test and Fisher's exact test. Effect modification between various factors and menopause status on disengagement and exhaustion was evaluated by stratified analysis. Statistical interaction was tested using the Likelihood Ratio test comparing the logistic regression models with and without interaction terms. Hypothesis testing was two-sided with a significance level set at 0.05. Data cleaning and analysis were performed using Stata statistical software (StataCorp, 2021).

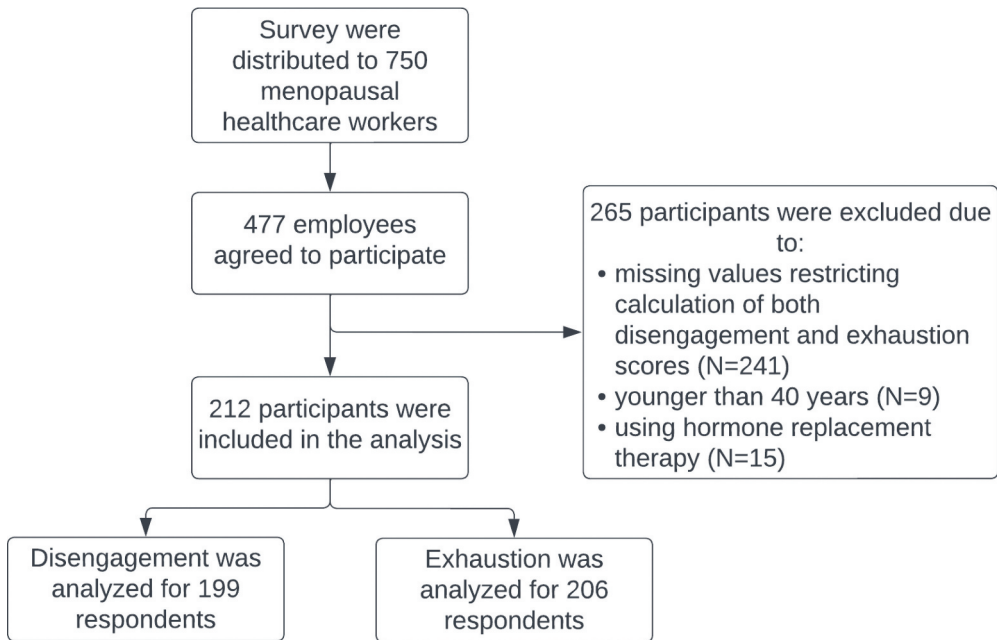
## **Findings**

The selection of participants based on inclusion and exclusion criteria resulted in a final sample including 212 participants (Figure 1). Insignificant missing values due to item non-response led to some inconsistencies between numbers of participants reported in specific rows of tables and the total sample size.

### **Study participants' socio-demographics, work, and behavioral characteristics**

Descriptive summary information is provided in Table 1. Among participants, more than half (60.7%) had specialized secondary education while one-third (32.7%) reported completing higher education. The majority of survey takers (55%) were married, and the mean age accounted for 51.1 years. Considering self-reported menopause status, almost half of the respondents (45.9%) indicated to be in postmenopause, while the rest of them indicated to be premenopause.

Most of the respondents (60.4%) had clinical job positions (doctors, nurses), while the remaining respondents were represented by non-clinical employment (Administration workers, Service Staff). Two-thirds (62.7%) of participants indicated having a work experience of more than 20 years, while 13.4% had been working less than 5 years. Each third survey taker (32%) spends all their working time dealing with patients and 29.1% of respondents indicate that interaction with patients takes up to a quarter of their working hours. Half of the participants (50%) indicated working from 40 to 60 hours per week, while some (20.2%) reported working more than 60 hours weekly. A significant proportion of participants (42.2%) had night shifts and each third was working either in the surgical (29.5%) or therapeutic (36.3%) department. Only a few participants (10.5%) work in several jobs and almost one-third (28.6%) have managerial



**Figure 1.** Flow-chart of selection of participants included in the analysis.

responsibilities. While the majority (71.4%) were generally satisfied with their job, fewer participants (63.3%) agreed that salary was satisfactory. Most respondents (82.7%) were satisfied with their work environment.

Disengagement and exhaustion were evaluated by the corresponding statements in the OBI instrument. Disengagement scores were calculated for 199 respondents and the values ranged from 1 to 3.9 with an average score accounting for 2.15 (SD 0.44). Similarly, exhaustion scores, which were available for 206 survey takers, ranged from 1.25 to 3.5 and the mean score was 2.31 (SD 0.4). For both disengagement and exhaustion, higher scores correspond to more severe level of a condition. Using the cut-off 2.1, participants were categorized based on disengagement scores to those having and not having disengagement. For similar categorization of exhaustion scores, the cut-off 2.25 was utilized. This resulted in 63.9% of respondents having disengagement and 61.7% having exhaustion. Furthermore, 77% of survey takers were found to have either disengagement or exhaustion or both, while 23% did not have burnout. Two-thirds of respondents (68.2%) reported that most of the time or always they are given supportive feedback on the work, while half of the participants (52%) agreed that they could talk to their line manager about annoying or upsetting issues with a similar frequency. More than half of survey takers (66.9%) were prone to receive help and support from their colleagues.

### ***Associations between socio-demographics, behavioral and work-related characteristics, and prevalence of disengagement and exhaustion***

In bivariable analysis, four factors were significantly associated with disengagement and six independent variables with exhaustion (Table 2). Specifically, participants' age was related to disengagement with borderline statistical significance, with disengaged participants being younger by 1.4 years on average than those not having disengagement. The affiliated department was significantly associated with disengagement ( $p = 0.034$ ). The highest prevalence of disengaged workers was revealed among employees of surgical departments

**Table 1.** Summary information on independent variables, including socio-demographics, behavioral and work-related characteristics of the sample.

Variable	N (%) or mean $\pm$ SD
<b>Age</b> , mean $\pm$ SD	51.14 $\pm$ 5.55
<b>Marital Status</b>	
Married	116 (54.98%)
Other (Single, widowed, divorced)	95 (45.02%)
<b>Education level</b>	
Higher education	69 (32.7%)
Specialized secondary education	128 (60.66%)
Other	14 (6.64%)
<b>Having chronic disease</b> (not severe)	
Yes	90 (44.78%)
No	111 (55.22%)
<b>Alcohol intake</b>	
Yes	32 (15.46%)
No	175 (84.54%)
<b>Job position</b>	
Clinical (Doctors, nurses)	125 (60.39%)
Non-clinical (administration, service staff)	82 (39.61%)
<b>Work experience</b>	
$\leq$ 5 years	28 (13.4%)
6–20 years	50 (23.92%)
21+ years	131 (62.68%)
<b>% of work dealing with patients</b>	
0–25%	59 (29.06%)
50–75%	79 (38.92%)
100%	65 (32.02%)
<b>Working hours per week</b>	
<40 hours	62 (29.81%)
40–60 hours	104 (50%)
>60 hours	42 (20.19%)
<b>Having night shifts</b>	
Yes	89 (42.18%)
No	122 (57.82%)
<b>Having lunch breaks</b>	
Yes	178 (83.96%)
No	34 (16.04%)
<b>Affiliated department</b>	
Surgery	43 (29.45%)
Internal Medicine	53 (36.3%)
Other*	50 (34.25%)
<b>Having another job</b>	
Yes	22 (10.48%)
No	188 (89.52%)
<b>Having management duties</b>	
Yes	59 (28.64%)
No	147 (71.36%)
<b>Generally satisfied with job</b>	
Yes	147 (71.36%)
No	59 (28.64%)
<b>Satisfied with salary</b>	
Yes	76 (36.71%)
No	131 (63.29%)
<b>Satisfied with work environment</b>	
Yes	172 (82.69%)
No	36 (17.1%)
<b>Menopause status</b>	
Premenopause	106 (54.08%)
Postmenopause	90 (45.92%)
<b>Disengagement score</b> , mean $\pm$ SD	2.15 $\pm$ 0.44
Presence of disengagement	
Yes	140 (63.9%)
No	79 (36.1%)
<b>Exhaustion score</b> , mean $\pm$ SD	2.31 $\pm$ 0.4

(Continued)

**Table 1.** (Continued).

Variable	N (%) or mean $\pm$ SD
<b>Presence of exhaustion</b>	
Yes	142 (61.7%)
No	88 (38.3%)
<b>Presence of both disengagement and exhaustion</b>	
Having both	103 (48.4%)
Having only one	61 (28.6%)
Absence of both	49 (23%)
<b>I am given supportive feedback on the work I do</b>	
Never/Sometimes/Neutral	57 (31.84%)
Most of the time/Always	122 (68.16%)
<b>I can talk to my line manager about something that has annoyed or upset me</b>	
Never/Sometimes/Neutral	85 (48.02%)
Most of the time/Always	92 (51.98%)
<b>I get help and support from my colleagues</b>	
Never/Sometimes/Neutral	58 (33.14%)
Most of the time/Always	117 (66.86%)

\*Laboratory, pathology, genetics, and radiology departments.

(76.9%), followed by those working in the departments of internal medicine (67.9%). Borderline statistically significant results were obtained regarding the association between general satisfaction with their job and the prevalence of disengagement ( $p = 0.09$ ) with a lower proportion of disengaged participants among those satisfied with their job compared to dissatisfied workers (56.9 vs 63.2%). Among respondents dissatisfied with salary, there were significantly more disengaged individuals (72.4%) than those reporting that salary meets their needs (43.8%).

Concerning the prevalence of exhaustion, work experience was statistically significantly associated in bivariate analysis ( $p = 0.023$ ). The highest proportion of disengaged workers (67.5%) was observed among those with more than 20 years of work experience. Concerning respondents dissatisfied with their job, there were significantly more cases of exhaustion (72.9%) in comparison with the group of satisfied workers (53.9%). Satisfaction with salary was statistically significantly associated with exhaustion as well, with the group of satisfied individuals having a lower prevalence of exhaustion (46.7%) compared to those dissatisfied with salary (65.9%). A significantly higher prevalence of exhaustion was observed among individuals dissatisfied with their work environment (74.3%) compared to those reporting that their work environment was satisfactory (56.3%).

Participants who reported not receiving supportive feedback at work or receive it sometimes had significantly higher proportion of both disengaged (72.7 vs 56.4%) and exhausted (70.2 vs 53.4%) compared to those receiving such feedback most of the time or always. Similarly, disengagement and exhaustion were more prevalent among respondents who indicated to never get help and support from colleagues or have it sometimes compared to respondents answering 'Most of the time' or 'Always' to this statement. A self-reported menopause status was not significantly related to either disengagement ( $p = 0.838$ ) or exhaustion ( $p = 0.222$ ), while a higher prevalence of both outcomes was revealed among the postmenopause group (Figure 2).

### ***Analysis of interactions between socio-demographic, work-related variables and menopause status on the prevalence of disengagement and exhaustion***

Prevalence of disengagement and exhaustion was reported among participants with different socio-demographic and work-related characteristics stratified by their self-reported menopause status (Table 3). The borderline statistical significance ( $p = 0.07$ ) was revealed concerning the interaction between job position and menopause status on disengagement. These results indicate that higher prevalence of disengaged respondents was among non-clinical premenopausal workers (64%)



**Table 2.** Associations between independent variables and the outcomes of prevalence of disengagement and exhaustion.

Variable	Prevalence of Disengagement	p-value	Prevalence of Exhaustion	p-value
<b>Age, mean difference (Presence – Absence)</b>	-1.424	0.074	1.134	0.154
<b>Marital Status</b>		0.873		0.661
Married	61.11		60.34	
Other	62.22		57.3	
<b>Education level</b>		0.151		0.962
Higher education	53.73		60.29	
Specialized secondary education	66.67		58.54	
Other	50		57.14	
<b>Having chronic disease</b>		0.504		0.456
Yes	58.82		61.36	
No	63.55		56.07	
<b>Alcohol intake</b>		0.919		0.234
Yes	62.07		70	
No	61.08		58.48	
<b>Job position</b>		0.911		0.417
Clinical (Doctors, nurses)	61.54		61.98	
Non-clinical (administration, service staff)	62.34		56.25	
<b>Work experience</b>		0.787		0.023
≤5 years	55.56		46.43	
6–20 years	61.36		48.98	
21+ years	62.7		67.46	
<b>% of work dealing with patients</b>		0.68		0.173
0–25%	58.93		49.12	
50–75%	65.38		63.64	
100%	59.32		63.49	
<b>Working hours per week</b>		0.992		0.386
<40 hours	62.5		52.46	
40–60 hours	61.62		61.39	
>60 hours	62.5		65	
<b>Having night shifts</b>		0.501		0.531
Yes	63.86		56.47	
No	59.13		60.83	
<b>Having lunch breaks</b>		0.109		0.551
Yes	58.93		60.12	
No	74.19		54.55	
<b>Affiliated department</b>		0.034		0.287
Surgery	76.92		73.81	
Internal Medicine	67.92		62.26	
Other	51.02		58.33	
<b>Having another job</b>		0.812		0.249
Yes	59.09		47.62	
No	61.71		60.66	
<b>Having management duties</b>		0.407		0.179
Yes	56.9		52.63	
No	63.24		62.94	
<b>Generally satisfied with job</b>		0.091		0.013
Yes	56.52		53.9	
No	69.64		72.88	
<b>Satisfied with salary</b>		<0.001		0.007
Yes	43.84		46.67	
No	72.36		65.87	
<b>Satisfied with work environment</b>		0.475		0.049
Yes	61.11		56.29	
No	67.65		74.29	
<b>Menopause status</b>		0.838		0.222
Premenopause	60.61		54.9	
Postmenopause	62.07		63.64	
<b>I am given supportive feedback on the work I do</b>		0.04		0.034
Never/Sometimes/Neutral	72.73		70.18	
Most of the time/Always	56.41		53.39	
<b>I can talk to my line manager about something that has annoyed or upset me</b>		0.097		0.523

(Continued)

Table 2. (Continued).

Variable	Prevalence of Disengagement	p-value	Prevalence of Exhaustion	p-value
Never/Sometimes/Neutral	68.67		61.45	
Most of the time/Always	56.32		56.67	
<b>I get help and support from my colleagues</b>		0.028		0.015
Never/Sometimes/Neutral	73.21		70.69	
Most of the time/Always	55.75		51.33	

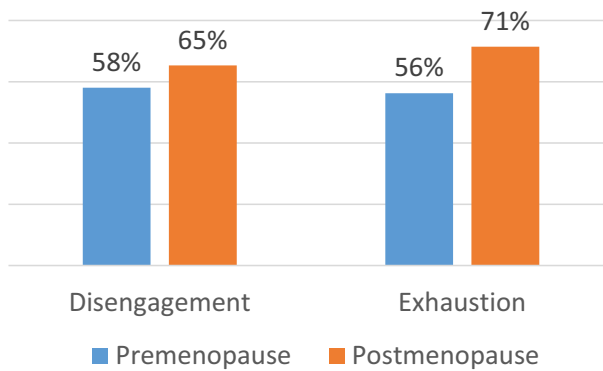


Figure 2. Prevalence of disengagement and exhaustion by menopause status.

compared to clinical premenopausal persons (58%). However, proportion of disengaged respondents was higher among postmenopausal clinical persons (65%) compared to postmenopausal non-clinical workers (58%). The effect of having another job on disengagement also was significantly modified by menopausal status. In fact, more responses of disengagement were observed among premenopausal workers, who were involved in additional jobs (75%), compared to premenopausal workers without another job (58.1%). However, in postmenopause group, the higher prevalence was revealed among those not having another job (65.8%) in comparison with individuals having additional employment (40%).

## Discussion

The main finding of this work is the existence of a very high frequency of burnout among female healthcare workers in UMC hospitals. Although there is significant fluctuation in the frequency of burnout, as well as significant differences in how burnout was defined, assessed, and studied (Rotenstein et al., 2018), most of the studies (Adriaenssens et al., 2015; Cañadas De la Fuente et al., 2015; Rotenstein et al., 2018) report a high prevalence of burnout among healthcare workers. The systematic review by Rotenstein et al. (2018), which included studies from 42 countries, revealed a burnout prevalence of 67% with varying estimates for burnout subcomponents, such as emotional exhaustion (72%), depersonalization (68%) and low personal accomplishment (63.2%) (Rotenstein et al., 2018). The result of our study with 63.9% of respondents having disengagement and 61.7% having exhaustion are comparable with these findings.

Existing research in the field of occupational health psychology (Converso et al., 2019) has identified numerous factors within the healthcare work environment that could elevate the likelihood of experiencing burnout. One of the most widely recognized risks for occupational burnout is mentally and physically demanding daily practices (Browning, 2019; Converso et al., 2019). Additional work-related burnout risk factors might encompass high job demands, experiencing

**Table 3.** Analysis of association between independent variables and prevalence of disengagement and exhaustion stratified by menopause status.

Variable	Prevalence of Disengagement		p-value	Prevalence of Exhaustion		p-value
	Premenopause	Postmenopause		Premenopause	Postmenopause	
<b>Marital Status</b>			0.349			0.341
Married	57.89	64.29		54.84	69.77	
Other	64.29	60		55	57.78	
<b>Education level</b>			0.362			0.636
Higher education	60	48.39		60	59.38	
Specialized secondary education	62.96	70.59		54.39	62.75	
Other	50	50		40	100	
<b>Having chronic disease</b>			0.744			0.479
Yes	59.38	60		51.52	68.63	
No	61.54	65.71		53.85	60	
<b>Alcohol intake</b>			0.224			0.243
Yes	68.18	42.86		71.43	57.14	
No	58.11	63.75		51.28	65	
<b>Job position</b>			0.07			0.43
Clinical (Doctors, nurses)	58.06	65.31		56.25	71.43	
Non-clinical (administration, service staff)	63.89	58.33		54.05	54.05	
<b>Work experience</b>			0.306			0.449
≤5 years	61.11	50		47.37	37.5	
6–20 years	50	78.57		42.31	66.67	
21+ years	64.29	60		65.45	66.15	
<b>% of work dealing with patients</b>			0.38			0.555
0–25%	65.38	51.72		44.44	55.17	
50–75%	63.16	66.67		61.11	61.76	
100%	54.55	68		58.33	75	
<b>Working hours per week</b>			0.1			0.416
<40 hours	56.25	71.43		45.45	60.87	
40–60 hours	66.67	56		63.04	62	
>60 hours	55	78.57		57.14	69.23	
<b>Having night shifts</b>			0.279			0.33
Yes	57.14	70.97		50	67.74	
No	63.16	57.14		58.62	61.4	
<b>Having lunch breaks</b>			0.306			0.513
Yes	58.14	60.56		55.68	63.38	
No	76.92	68.75		50	64.71	
<b>Affiliated department</b>			0.271			0.523
Surgery	64.71	88.89		63.16	78.95	
Internal Medicine	66.67	69.57		66.67	56.52	
Other	54.55	48.15		57.14	59.26	
<b>Having another job</b>			0.04			0.262
Yes	75	40		54.55	40	
No	58.14	65.79		55.56	66.23	
<b>Having management duties</b>			0.385			0.211
Yes	58.82	52.38		53.13	47.62	
No	60.32	67.19		55.88	70.77	
<b>Generally satisfied with job</b>			0.259			0.652
Yes	58.57	54.1		49.3	57.38	
No	61.54	80		70.37	76.92	
<b>Satisfied with salary</b>			0.868			0.769
Yes	43.24	42.42		43.59	46.88	
No	71.67	75.47		61.67	72.22	
<b>Satisfied with work environment</b>			0.633			0.197
Yes	59.76	60.56		53.57	59.15	
No	64.71	78.57		61.11	92.86	
<b>I am given supportive feedback on the work I do</b>			0.101			0.86
Never/Sometimes/Neutral	64.29	81.82		65.52	69.57	
Most of the time/Always	58.62	55.36		49.15	58.93	
<b>I can talk to my line manager about something that has annoyed or upset me</b>			0.378			0.476

(Continued)

**Table 3.** (Continued).

Variable	Prevalence of Disengagement			Prevalence of Exhaustion		
	Premenopause	Postmenopause	p-value	Premenopause	Postmenopause	p-value
Never/Sometimes/Neutral	63.41	72.97	0.191	51.22	67.57	0.113
Most of the time/Always	60.47	53.66		57.78	57.14	
<b>I get help and support from my colleagues</b>						
Never/Sometimes/Neutral	71.43	73.91		68.97	66.67	
Most of the time/Always	52.63	59.26		44.64	60	

\*P-values are from the Likelihood ratio test comparing Logistic regression models with and without interaction term.

role conflict, having to deal with a highly uncertain work environment, and perceiving poor social support or organizational justice (Aronsson et al., 2017).

Factors contributing to burnout among hospital workers include work overload, time pressure, administrative burden, frequent exposure to suffering, death, social inequalities, and less autonomy due to complex management (Rodrigues et al., 2017). Apart from the influence on physical and mental health, burnout leads to absenteeism, decreased productivity, lower patient satisfaction, reduced quality of care, and increased frequency of medical errors (Martins et al., 2024).

Our analysis showed that working in the surgical department was associated with disengagement. Previous studies (Albendín et al., 2016; Chuang et al., 2016; Gómez-Urquiza et al., 2016; Monsalve-Reyes et al., 2018) showed that the relationship between hospital department and the level of burnout among healthcare workers. Observed prevalence of disengagement among workers in surgical departments can be explained by longer hours, night shifts, and greater obstacles to work-life balance (Adriaenssens et al., 2015; Aronsson et al., 2017). Our study showed that participants with longer work experience frequently had exhaustion. However, controversial results are shown in another study, where working in one department for a long time was associated with less burnout (Adriaenssens et al., 2015).

In our study participants satisfied with salary and work environment reported less exhaustion than dissatisfied respondents. Another similar study by Wright et al. (2022) reported results in alignment with our findings, highlighting that work environment satisfaction was associated with less burnout (Wright et al., 2022). Regarding salary satisfaction, our findings cannot be compared since none of the existing studies analysed this factor as a possible cause of burnout among healthcare workers.

Among the most important findings of our study, we found no association between menopause and burnout among healthcare workers. These findings are consistent with the results of the some previously reported studies discussed below (Hardy et al., 2018; Hickey et al., 2017). In a study including respondents from three hospitals in Australia there was no significant correlation between the reproductive stage of women and work engagement, organizational commitment, or job satisfaction among midlife women (Hickey et al., 2017). Additionally, the study investigating women in trade unions and professional associations for family court and probation staff in England, Wales, and Northern Ireland did not find any significant relationship between menopausal status and work outcomes (Hardy et al., 2018).

Despite the absence of a relationship between menopause and burnout, there is an indirect effect of menopausal symptoms on women's ability to handle the workload and job satisfaction. The study conducted in the US showed that menopausal symptoms had an adverse impact on their work motivation and commitment, leading to increased turnover intention or a desire to exit the labor market completely (Hickey et al., 2017). Vasomotor symptoms of menopause also were shown to interfere with the work process (Hardy et al., 2018). However, the research performed in Japanese women revealed that job task performance is not affected by menopausal vasomotor symptoms (Aronsson et al., 2017).

Based on previous findings, burnout is prevalent among healthcare workers in low- and middle-income countries (Wright et al., 2022). Nevertheless, there is a scarcity of research on the relationship between menopause and burnout in these countries. Burnout prevalence varies across different countries, and it may be challenging to apply research findings from high-income countries to low- and middle-income countries due to cultural differences (Wright et al., 2022). Furthermore, significant cross-national differences among results are found even among studies in developed countries, including North American and Dutch populations (Aronsson et al., 2017), as well as among Irish, Greek, Italian, Polish, and British populations (Adriaenssens et al., 2015). However, there is a scarcity of studies investigating burnout among menopausal healthcare workers in Central Asian region.

Our study was carried out throughout the period of 2021 to 2023, which partially overlapped with the COVID-19 pandemic. COVID-19 pandemic had a high impact on the mental health of health care workers, regardless of profession and specialty (Elsayed et al., 2023; Hwajj et al., 2022; Kamberi et al., 2021; Nu Htay et al., 2021). Regarding occupational burnout, approximately half of the healthcare workers experienced occupational exhaustion and depersonalization with impaired personal accomplishment (Marzo, Khaled, et al., 2022). Risk factors for severe mental health issues included marital status, occupation, and workplace, especially ICU (Htay et al., 2020; Marzo et al., 2021; Marzo, ElSherif, et al., 2022). As soon as women at menopause have increased physiological and psychological demands, it might be hypothesized that COVID-19 pandemic with high workload provoke the menopause-related occupational burnout, although we failed to identify such publications in evidence-based data sources.

The present study also showed the importance of support and encouragement from colleagues in coping with burnout among healthcare workers. Workers who were able to cope with job demands and had the capacity to deal with job responsibilities were at a low risk of burnout. Higher disengagement and exhaustion scores were determined in healthcare workers who did not receive supportive feedback on their completed work. On this matter, our study supports that work environment have a significant impact on professional's mental well-being (Kopenhagen & Guidozi, 2015; Verdonk et al., 2022).

### **Study strengths and limitations**

Participants in this study represent various groups of healthcare workers. In fact, the study sample covers employees from pre- and postmenopausal age groups with various levels of education, experience, and occupational working conditions, and this makes the findings of this study generalizable to other healthcare settings. The existing studies on menopause and occupational health issues are mostly oriented on white and middle-class women; from this perspective, the present study conducted in Kazakhstan will contribute to knowledge about menopause and burnout in Central Asian population.

Several limitations should be considered for a proper data interpretation of this study. The sample study includes only 212 women and although corresponds to 4 centers, all of them are part of the same multi-center organization, UMC, which may limit the validity. The inability to evaluate the temporal associations between independent and outcome variables, as well as vulnerability to nonresponse and recall bias, are all intrinsic limitations of the cross-sectional study design. Mentioned characteristics of cross-sectional study design limit causality assessment and the generalizability of the findings to other regions or demographics. In this study, the outcome variables could be evaluated only for half of the participants, who agreed to participate in the study and started answering the questions. Those who are not responding to questions evaluating the outcome variable might have significantly different disengagement and exhaustion scores compared to participants included in this study. Item non-response regarding the outcome variable might be influenced by some external factors like severe stress. Thus, reported mean scores for mentioned outcomes might be biased. In addition, even though due to item non-response and consequent reduction of sample size statistical power was insufficient for many advanced statistical techniques,

we performed stratified analysis searching for interaction between independent variables and menopause status.

### **Practical implications for healthcare management**

Given that a significant proportion of women is engaged in employment during menopause, the implementation of specific programs for this group should be warranted. Our study showed that two-thirds of healthcare workers experience burnout, so the prevention and timely management of its underlying causes should be a priority for the medical community. Healthcare organizations' leadership should identify the most appropriate interventions and implement them to improve healthcare workers' mental health and well-being.

### **Conclusion**

Our study found that a significant proportion of respondents experienced burnout. Although menopause was not significantly associated with disengagement and exhaustion, postmenopausal clinical workers were more prone to have burnout. Age, work experience, and departmental affiliation were linked to disengagement, while work experience and satisfaction with the work environment were associated with exhaustion. Healthcare management should understand the importance of disengagement and exhaustion among postmenopausal healthcare workers and implement proper actions to improve their quality of life. Managers should encourage open communication with employees concerning work aspects that might trigger burnout. Positive and collaborative team culture is needed to support menopausal workers experiencing burnout.

### **Author contributions**

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work: ST, MT, ASA, GB, ASS. Drafting the work or reviewing it critically for important intellectual content: NK, AG, MT, ASS, ASL, GA, ASA, TU

Final approval of the version to be published: MT, ST. Agreement 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: KK, NK, MA, TU, GA, AG. All authors have read and agreed to the published version of the manuscript.

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## Data availability statement

The data that support the findings of this study are available from the corresponding author, NK, upon reasonable request.

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