



# Associations of menopausal symptoms with job-related stress factors in nurses in Japan



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## ABSTRACT

**Objective:** The main objective was to ascertain the typical menopausal symptoms and job-related stress factors in Japanese nurses during the menopausal transition, and the associations of menopausal symptoms with job-related stress. A supplementary objective was to determine whether there were any differences in menopausal symptoms and job-related stress factors among nurses in managerial positions. **Methods:** One thousand seven hundred female registered nurses aged 45–60 years who were working in hospitals in Japan were asked to complete a self-administered survey that included Greene's Climacteric Scale and the Brief Job Stress Questionnaire.

**Results:** The proportions of nurses who reported feelings of tiredness, irritability and difficulty in concentration were higher than the proportions with other menopausal symptoms. The proportions of nurses reporting feeling unhappy or depressed and having crying spells were higher among nurses in managerial positions than among other nurses. Stresses related to 'quantitative overload' on the Brief Job Stress Questionnaire among nurses in managerial positions were significantly greater than among nurses not in managerial positions, while stresses related to 'physical overload', 'job control', 'skill discretion', 'workplace environment' and 'job satisfaction' among nurses not in managerial positions were significantly greater than they were among nurses in managerial positions. Psychological symptoms were significantly correlated with poor job-related interpersonal relationships.

**Conclusions:** Health care practitioners should be aware that menopausal symptoms are associated with job-related stress during the menopausal transition. Information on the differences in these associations between nurses in managerial positions and other nurses is important as it will allow their health care to be managed on a more individual basis.

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## 1. Introduction

Menopausal symptoms are attributed to hormonal changes but are also influenced by psychological stress due to social factors in the home and workplace. Indeed, job-related stress is an increasingly important factor because of the rising number of menopausal women in the workplace. There are complex interrelationships between job-related stress and menopausal symptoms. In a cross-sectional study of Egyptian middle-aged female teachers,

Hammam et al. found that the menopausal symptoms the women viewed as affecting their capacity for work and their performance were tiredness, sleep disturbance, poor memory and concentration and depressed mood [1]. In addition, the presence of various menopausal symptoms such as poor concentration and memory, tiredness, vasomotor symptoms, psychological symptoms and somatic symptoms have been shown to be associated with work efficiency, personal relationships and family relations, as well as quality of life [2–4].

Nursing has a high proportion of shift work [5] and is perceived as a very stressful occupation [6,7]. It has been suggested that the job stress of shift workers is greater than that of day workers [8,9]. Additionally, Harada et al. reported that shift-related job stress is an important contributor to health problems [10]. Unsurprisingly, chronic job-related stress in nurses is associated with low job satisfaction [6,11]. Furthermore, Faragher et al. showed in a

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meta-analysis that the level of job satisfaction was strongly associated with mental problems [12]. It therefore seems that job-related stress affects both the mental and the physical health of nurses. The physical and mental health of nurses might, in turn, affect the amount of time they have off work as well as the quality of care they provide and so patient satisfaction [13].

The labor force participation rate of women at the menopausal transition was 72.7% in 2013 in Japan [14]; the proportion of working nurses at the menopausal transition was 42.5% [15]. Therefore, a study focusing on nurses at the menopausal transition is important. However, there have been few studies of menopausal symptoms among nurses. Recently, it was reported that the frequencies of menopausal symptoms such as fatigue, irritability and arthralgia were high in middle-aged nurses compared with a community population [16]. Furthermore, nurses in managerial positions (e.g. directors of a nursing department and head nurses) face particularly high levels of job-related stress [17]. This might mean that they experience menopausal symptoms that differ in type or degree from those of nurses who are not in managerial positions. To the best of our knowledge, this hypothesis has not been tested.

We investigated menopausal symptoms and job-related stress in Japanese registered nurses at the menopausal transition. In addition, we investigated differences in menopausal symptoms and job-related stress among nurses in managerial positions and those not in managerial positions.

## 2. Subjects and methods

This study was conducted from September to December 2013. We first asked public and private hospitals in Japan whether they could assist with our research. Twenty-six public hospitals and two private hospitals agreed to cooperate. From these, a total of 1700 female registered nurses, including 850 nurses in managerial positions, aged 45–60 years, were invited to participate in the study. We defined managerial position as director of a nursing department or head nurse. Participants were informed of the purposes and procedure of the study in the invitation letter.

### 2.1. Questionnaire

We designed a self-administered questionnaire consisting of three parts. It took about 20 min to complete. The first part had questions on sociodemographic factors, lifestyle and medical history. It covered age, height and weight, marital status, menstrual and menopausal status, drug treatment, smoking, alcohol intake and living environment. Respondents were classified as premenopausal (regular menstrual cycle during the past 12 months), perimenopausal (irregular menstruation during the past 12 months) and postmenopausal (no menstruation during the past 12 months).

The second part of the questionnaire reproduced Greene's Climacteric Scale, which measures the extent to which an individual is affected by menopausal symptoms. The scale lists 21 symptoms, and participants record "not at all", "a little", "quite a bit" or "extremely" [18]. The list includes psychological, somatic and vasomotor symptoms, and loss of sexual interest is also assessed.

The third part consisted of questions on occupation, including job rank, years of nursing experience and frequency of night shifts. Job-related stress factors were assessed in this part through the Brief Job Stress Questionnaire, which was provided by the Ministry of Labour in Japan [19]. There were 17 questions in 9 categories, which were quantitative overload, qualitative overload, physical overload, job control, skill discretion, interpersonal relationships, workplace environment, job fitness and satisfaction with work. A response of "Yes", "Yes to some extent", "Not really" or "No" was

given to the following 17 statements: (1) You have to do an enormous amount of work, (2) You cannot complete all of your work in the allotted time, (3) You have to work very hard, (4) You have to focus your attention quite a lot, (5) You do a difficult job that requires a high level of knowledge and skill, (6) You have to constantly think about work during your working hours, (7) You do a lot of physical work, (8) You can work at your own pace, (9) You can decide the order in which you do your work and the way you do it, (10) You can express your own opinions on the workplace strategy, (11) You do not frequently use your skills and knowledge in the job, (12) There are differences of opinion within your department, (13) Your department does not get on well with other departments, (14) The atmosphere in your workplace is friendly, (15) The environment of your workplace (noise, light, humidity and ventilation) is not so good, (16) The content of your work suits you, and (17) You have job satisfaction in your work. Some items were scored in reverse, such that lower scores consistently indicated higher degrees of job-related stress.

All the study data were generated from this self-administered questionnaire. The Ethics Committee of Tokushima University Hospital approved the study (number 1772).

### 2.2. Statistical analysis

Baseline characteristics such as age and BMI are presented as means  $\pm$  standard deviation. Each category variable is expressed as the number of nurses and their percentage of the sample. Scores on Greene's Climacteric Scale among the pre-, peri- and postmenopausal groups of women are presented as medians with 25th and 75th percentiles. The significance of differences in variables other than age and BMI was evaluated by the chi-square test. We used the Mann-Whitney *U* test to determine the differences in menopausal symptoms between nurses in management positions and the other nurses. The differences in menopausal symptoms and job-related stress factors across the pre-, peri- and postmenopausal groups were evaluated by the Kruskal-Wallis rank test. Correlations between Greene's scores and scores on job-related stress factors were determined using Spearman's rank order correlation analysis. All *p* values are two-tailed and those less than 0.05 are considered to be statistically significant. Statistical analyses were carried out using SPSS version 21 for Windows.

## 3. Results

The overall response rate was 77.4% (1316/1700). We excluded incomplete questionnaires ( $n=26$ ) and we excluded women outside the age range in the inclusion criteria ( $n=15$ ) and pregnant woman ( $n=1$ ). In addition, women were excluded who had taken medications that might mask menopausal symptoms, including hormone replacements ( $n=13$ ), antidepressant or anti-anxiety drugs ( $n=13$ ), and thyroid hormone and anti-thyroid drugs ( $n=50$ ). Women with coronary heart disease ( $n=14$ ) and rheumatoid arthritis ( $n=15$ ) were also excluded. Thus, questionnaires from 1169 nurses were used for analysis. The numbers in the tables vary due to missing values in the answer column. Of the final sample, 44.0% (514/1169) were in managerial positions.

The background characteristics of the nurses are shown in Table 1. The nurses in managerial positions had more years of nursing experience than the other nurses. The frequency of night shifts tended to be higher in the group not in managerial positions. Of the 1169 nurses, 81 had had menopause induced by surgery (i.e. total hysterectomy or oophorectomy). We did not include these nurses in the pre-, peri- and postmenopausal categorization. The numbers of nurses in the pre-, peri- and postmenopause groups were 338 (28.9%), 219 (18.8%) and 531 (45.4%), respectively, and there was

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