

## WORKPLACE-RELATED STRESS AMONG PHYSICIANS IN MONGOLIA: A CROSS-SECTIONAL STUDY

Sukhee Erdenetuya<sup>1,3</sup> §, Sovd Tugsdelger<sup>2</sup>, Yoshitoku Yoshida<sup>3</sup>, Junichi Sakamoto<sup>3</sup>, Nobuyuki Hamajima<sup>4</sup>

<sup>1</sup> Department of Public Administration and Management, Ministry of Health, Mongolia

<sup>2</sup> Department of Public Health Policy Implementation, Ministry of Health, Mongolia

<sup>3</sup> Young Leaders' Program, Nagoya University Graduate School of Medicine, Nagoya 466-8550, Japan

<sup>4</sup> Department of Preventive Medicine/Biostatistics and Medical Decision Making, Nagoya University Graduate School of Medicine, Nagoya 466-8550, Japan

§Corresponding author

### Abstract

Mongolia faces challenges in health sector human resource development. Every year 4-5% of all physicians change their employment place within the health sector, and another 3-4% leave their jobs for reasons other than retirement. To date, no thorough analysis of occupational stress among physicians has been conducted despite the fact that workplace-related stress could be one of the key reasons for staff shortages in the health sector. This study was conducted to assess physicians' workplace-related stressors in Mongolia, using Occupational Stress Index for Physicians (OSI-MD).

In total, 219 physicians (179 females and 40 males) participated in the study. The participants were classified into three groups: 1) physicians in the surgical field; 2) other physicians involved in patient care, and 3) physicians not involved in direct patient care. An analysis of variance was used for a comparison of the stress scores among the groups.

Physicians involved in patient care had a higher total score for the aspects of "high demand", "strictness", and "extrinsic time pressure" than physicians not involved in direct patient care ( $p < 0.05$ ,  $p < 0.01$ , and  $p < 0.05$ , respectively). Physicians in the surgical field had a higher total score for "noxious exposure" and "threat avoidance" than other physicians ( $p < 0.01$  and  $p < 0.01$ , respectively). Physicians aged 50 years and over had a lower total score than ones ( $p < 0.05$ ).

The present study demonstrated high occupational stress burden among physicians in Mongolia. The study further documented differences in workplace-related stressors among various physician groups and different levels of occupational stress burden according to the physician's age.

**Key words:** Personnel management, staff development, workload, stress, professional burnout.

### 1. Background

Workplace-related stress is a pattern of physiological, emotional, cognitive and behavioral reactions to some extremely taxing aspects of work content, work organization and work environment [1]. Nowadays, this issue is recognized worldwide as a major challenge to workers' health, [1,2] and every year many working individuals suffer from work-related illnesses, including stress, depression, or anxiety. Workplace-related stress can have a negative effect on health, and may further affect a worker's

organizational performance due to costs associated with increased absenteeism and staff turnover, diminished productivity, a rise in unsafe working practices and accident rates, increased complaints from clients/customers, replacement of absent workers, and training of substitute workers [1-3].

It has been reported that low job satisfaction was associated with high work stress [4-6]. Several studies have demonstrated the association between stressful work and the risk of cancer, cardiovascular diseases, mental health



problems, and immune dysfunction [6-10]. Other studies have suggested that work-related stress may result in higher labour turnover, making it difficult to retain staff [11]. A study in Australia has reported that many general practitioners have considered abandoning their general practice because of occupational stress [12].

Mongolia has an almost 85-year history in the development of modern health services and a well-established network of health care providers across the country. However, similar to the situation in many developing countries, the health system of Mongolia faces several challenging issues in human resource development, including high turnover and a shortage of health staff. According to the country's official statistics, every year 4-5% of all physicians change their place of employment within the health sector, and an additional 3-4% leave their jobs for reasons other than retirement [13-16].

There have been few studies in Mongolia on workplace-related stress in general. In addition, there is no thorough study on physicians' occupational stress, despite the fact that it could be one of the key reasons for high labour turnover and staff shortages in the health sector.

There are several models/methods to examine workplace-related stress, such as the Occupational Stress Index [17], Job Demand-Control Model [18], Effort-Reward Imbalance Model [18], Occupational Stress Indicator and Pressure Management Indicator [19], Nurse Stress Index [20], and General Practitioner Stress Index [21]. The present study aimed to assess physicians' workplace-related stressors in Mongolia, using the Occupational Stress Index for Physicians (OSI-MD) (2003 version).

## 2. Methods

### Subjects

Subjects were randomly selected from all levels of health care system of Mongolia; 210 physicians in the capital city of Ulaanbaatar, and 160 in 5 provinces (Arkhangai, Gobi-Altai, Orkhon, Umnugobi, and Khentii provinces), for a total of 370 physicians. Individual verbal consent was obtained from all participants after informing them of the purpose of the study. The data were collected by 8 trained field researchers using the OSI-MD questionnaire.

Information was collected on demographic characteristics, length and location of work, type of practice and setting, working hours and scheduling, salary and possibilities for career advancement, working conditions and noxious physical exposures, mishaps at or regarding work, time pressure, problems, constraints and influences at work, inter-personal interactions and social climate, workload and activities, and recent changes at work.

### OSI-MD questionnaire

The OSI-MD questionnaire (version 2003) consists of 112 questions to assess the working conditions and well-being of physicians, including task level, work schedule, physical, chemical, and other wide-ranging organizational factors, all of which can contribute to the burden of workplace stress [7,17]. The OSI-MD questionnaire was translated from English into Mongolian by the main researchers of this study and back into English by an independent translator. The English back-translations were reviewed by Dr. K Belkic, the author of the general OSI and of occupation-specific OSI tools including OSI-MD. Three revisions to the translation were made until it met with the author's approval. The translated questionnaire was pre-tested to ensure that each question and all response options were clear and unambiguous.

For estimating physician's OSI, scores of individual elements calculated from one or more questions were then integrated into seven stressor aspects such as "under load", "high demand", "strictness", "extrinsic time pressure", "noxious physical exposures", "threat avoidance", and "conflict/uncertainty". These aspects can be summed in various combinations to assess the occupational stress burden, with the sum of all seven OSI-MD aspects yielding a total OSI-MD score [7,17].

"Under load" aspect includes such characteristics as homogeneity of information and tasks, monotonous work, adequacy of pay, and promotion prospects. "High demand" addresses the heterogeneity of information and tasks, burden on visual system, complexity of tasks and decisions, simultaneous task performance, need for communication with others, frequency of incoming signals and tasks, work hours, night shift work, and breaks/vacations. "Strictness" is defined by strict requirements for signal



detection, strict evaluation of performance, fixed body position at work, confined work space, and degree of influence over work schedule, tasks, and policy. "Extrinsic time pressure" includes deadline pressure, control of task performance rate and control of incoming signals. "Noxious exposures" addresses working conditions and exposures, such as noise, glare, vibration, heat, cold, and chemical toxins. "Threat avoidance" is defined by hazardous task performance, need for sustained alertness to avoid serious consequences, encountering visually disturbing scenes, listening to emotionally disturbing occurrences, serious consequences of wrong decisions, and physical harm/injury at work. "Conflict/uncertainty" includes such elements as conflicting demands in time and space, external factors hampering task performance, interpersonal conflicts, opposition to career advancement, abuses of power, and threat of job loss [7,17].

Each element of OSI-MD is scored on a scale from 0 to 2, with 0 being "not present" and 2 meaning "strongly present". Some elements are assigned fixed scores or narrowed score ranges [7,17]. Stressor aspect scores and the total OSI-MD score were calculated using a validated score sheet kindly provided by the OSI-MD author.

### **Statistical analysis**

The physicians were categorized into three groups: 1) physicians in the surgical field (surgeons/anesthesiologists/gynecologists); 2) other physicians involved in patient care; and 3) physicians not involved in direct patient care (e.g., hospital managers, health department officers). The means of the scores were examined using a *t*-test for two groups, and one-way analysis of variance (ANOVA) for three or more groups. Categorical data were compared using a chi-square test. These calculations were conducted using SPSS (version 15.0).

## **3. Results**

### **General characteristics**

Of 370 physicians, 219 (59.2%) responded; 179 females and 40 males. Their age ranged from 23 to 66 years with a mean age of 39.9 years. Among the 219 respondents, 26.0% were from tertiary level (referral) hospitals or centers, 59.4% from

secondary level health facilities, and the remaining 14.6% from primary healthcare organizations. Sixteen percent of the respondents were physicians in the surgical field, 72.6% were other physicians involved in patient care, and the rest were physicians not involved in direct patient care (11.4%). The majority of the study participants were specialized physicians (79.9%). The respondents who answered that they had a second job in addition to working as a physician, was 10.0%.

### **OSI-MD scores**

In the present study, 76 physicians responded to all questions necessary for the total OSI-MD estimation. It ranged from 57.7 to 97.7, with a mean of 80.4. There was no significant difference in the total OSI-MD mean scores among physicians in the surgical field, other physicians involved in patient care, and physicians not involved in direct patient care. Similarly, the differences in the total OSI-MD mean scores were not statistically significant between genders, among different levels of health care organization, or between urban and rural settings. However, as shown in Table 1, significant differences in the total OSI-MD mean scores were found with respect to age groups and work years as a physician. The mean  $\pm$  standard deviation of the total OSI-MD score for older physicians ( $72.7 \pm 8.0$  for those aged over 50) was lower than that in younger physicians ( $81.6 \pm 6.9$  for those aged 30 years or younger, and  $81.2 \pm 8.3$  for those aged 31-50) ( $p < 0.05$ ). Similarly, the longer the number of work years as a physician, the lower was the total OSI-MD mean score. The mean and standard deviations of the total OSI-MD score were  $82.3 \pm 7.7$  for physicians with less than 5 years of work experience,  $83.2 \pm 6.8$  for those with 5-15 years, and  $77.1 \pm 8.9$  for those with over 15 years ( $p < 0.05$ ).

Table 2 shows the mean scores of the 7 stressor aspects for three physician groups. They were calculated based on more respondents, for example, 211 respondents for "under load", 192 respondents for "high demand", and 175 respondents for "strictness" aspects. The total mean scores for "under load" and "conflict/uncertainty" were not significantly different among the three groups. In contrast, total mean scores for "high demand" and "strictness" aspects were significantly different among those groups



( $p < 0.05$  and  $p < 0.01$ , respectively). The total mean score of "extrinsic time pressure" was lower for physicians not involved in direct patient care than for those involved in direct patient care (physicians in the surgical field and other physicians involved in patient care) ( $p < 0.05$ ). Total mean scores for aspects of "noxious exposures" and "threat avoidance" were higher for those in the surgical field than for other physicians involved in patient care and physicians not involved in direct patient care ( $p < 0.01$  and  $p < 0.01$ , respectively).

Mean scores of some stress elements were high, including the need for sustained alertness to avoid serious consequences (1.9), lack of rest breaks (1.8), hazardous task performance (1.8), inadequacy of pay (1.7), and control of task performance rate (1.7). No significant differences in the percentage of those having specified stress elements as "present" or "strongly present" were found between urban and rural physicians, except for a significantly higher proportion of rural physicians reporting frequently working more than 42 hours a week ( $p < 0.01$ ), for significantly more urban physicians reporting frequently working under deadline pressure ( $p < 0.01$ ), and for those under substantial pressure from the need for sustained alertness to avoid serious consequences ( $p < 0.05$ ) (Table 3).

Almost three-fourths of the physicians answered that they faced problems in providing medical care to patients (68.9% occasionally, 8.2% frequently) due to external conditions such as a lack of the necessary supplies/medications (80.5%), lack of hospital beds (56.8%), understaffing (33.1%), and limitations to ordering tests (21.9%). Possible infections from blood and other body fluids (57.9%), and threat of violence from psychotic or other dangerous patients (39.3%) were cited as the most acute hazards on the job. Furthermore, 39 physicians (17.8%) responded that they had incurred physical harm or injury at workplace. It was relatively common for physicians to witness or hear about serious/fatal injury incurred by colleagues during work (14.4%); and to be required to testify in court as a physician (25.1%).

#### 4. Discussion

Several studies have demonstrated differences in physicians' stress levels according to their specialty. However, it is contradictory which specialty of physicians is more stressful. Ramirez et al. found that surgeon-consultants experienced the highest stress level compared to other consultants, while another study concluded that anesthesiologists did not experience significantly high stress compared to other health professionals [22,23]. A study using OSI-MD demonstrated significant differences in the scores of individual elements as well as in the aspects and total OSI-MD scores among female physicians in the surgical care, non-surgical clinical care, and diagnostic/preventive care groups [7].

In the present study, we did not detect significant differences in the total OSI-MD mean scores among physicians in the surgical field, other physicians involved in patient care, and physicians not involved in direct patient care in Mongolia. However, the study demonstrated several significant differences in specific aspects and elements of the OSI-MD among the above physician groups.

Physicians in the surgical field exhibited high total "noxious exposure" and total "threat avoidance" mean scores, which could be attributable to such specifics of their work as a need for sustained alertness to avoid serious consequences, listening to accounts of emotionally disturbing occurrences, exposure to strong light in the operating room, encountering visually disturbing scenes including severe burns and/or trauma, as well as acute hazards at work, especially possible infection from blood or other body fluids (e.g., cerebrospinal fluid, edema).

Physicians involved in patient care (those in the surgical field and others involved in patient care) had higher total mean scores for "high demand", "strictness", and "extrinsic time pressure" compared to physicians not involved in direct patient care due to the high frequency of incoming signals, generally higher burden on the visual system, a need for rapid decisions and rapid task execution, simultaneous task performance, fixed posture, limited chance to take time off from work,



longer work hours including night shifts, and little or no control over the number of patients.

In contrast, the score of deadline pressure ("extrinsic time pressure" element) was significantly higher among physicians not involved in direct patient care, although the total "extrinsic time pressure" mean score was significantly lower for this group compared to others. The fact that physicians not involved in direct patient care have to handle more paperwork on a strict deadline may account for this finding.

This study did not detect significant differences in the total "under load" and total "conflict/uncertainty" mean scores among the three groups, which could be related to the omnipresence of conflicting demands in time and space, an emotionally charged work atmosphere, external problems directly hampering the provision of adequate patient care, fixed or inadequate pay, a lack of promotion prospects, and lack of recognition of good work in the health sector of Mongolia. Common reports of the lack of rest breaks, limited control of task performance rate, and hazardous task performance in urban and rural settings could also be attributed to the abovementioned factors. The greater proportion of rural physicians reporting frequently working overtime could be related to spending more time to reach patients over such a vast catchment area, and the persistent shortage of physicians in rural areas.

Several studies have demonstrated gender differences in their stress research. Evidence from earlier studies has suggested that women experienced more stress and stress related problems in the workplace than their male counterparts. Most frequent and specific causes of workplace-related stress for women in both developed and developing countries include their dual role at home and work, gender issues, and sexual harassment [1]. Nevertheless, relatively few studies have paid attention to the gender differences in physician's occupational stress, and the findings of those few were inconsistent. Some discovered higher job stress and strain among female physicians compared to their male colleagues [5, 24, 25], and some did not [12, 26]. There is also evidence that male GPs perceived their work as more stressful and less satisfying than that of female GPs

[27]. Several researchers suggested that gender differences in workplace stress might be expected due to the different professional profiles of male and female physicians [5] besides family problems and gender issues. In this study we did not find significant differences in the total OSI-MD mean score between genders, which could be due to small sample size. Alternatively, it could be related to the study model and questionnaires. In OSI-MD, abuses of power or violations in the workplace were questioned, whereas specifically family problems, sexual harassment and other gender issues were not.

This study indicated that older (ages >50) and more experienced (>15 work years) physicians had lower total OSI mean scores than their junior (30 years or younger) and middle (31-50 years)-aged colleagues, and those with less than 15 years of work experience. This finding was similar to the results of several other studies, which found a significant decrease in occupational stress with increasing age [4,27,28]. Such a reduction in work-related stress with age and number of work years could be related to superior professional competence and experience. It could also be due to the fact that in Mongolia older physicians generally practice in outpatient clinics, do not usually work night shifts, handle fewer patients, and earn more than younger physicians.

There were some limitations inherent in this study. The cross-sectional design of the study did not permit the ascertainment of causality. The sample size was not sufficient to detect relatively small differences in total OSI-MD levels such as those between genders, among levels of health care, as well as between physicians in rural and urban settings. Although the overall sample size for the study was satisfactory, a relatively small percentage (35%) of study participants provided complete information necessary for the estimation of their total OSI-MD scores. However, the sample size seemed to be appropriate for the analysis of each stressor aspect as well as of elements separately. Another limitation might be related to a reporting bias, since we did not confirm the accuracy of responses to OSI-MD questionnaires by using more objective information sources such as workplace observations.



## 5. Conclusion

To our knowledge, this is the first study to investigate health professionals' workplace-related stress in Mongolia, and has revealed high occupational stress burden among physicians. The study has also demonstrated differences in workplace-related stressors among various physician groups, and different levels of occupational stress burden in terms of physician age.

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## Appendix

**Table 1: Mean and SD<sup>§</sup> of total OSI-MD<sup>§§</sup> by gender, age groups, and work years**

	Gender		Age groups			Work years			Overall
	Male	Female	<31	31-50	>50	<5	5-15	>15	
Total OSI-MD (Mean ±SD)	82.6±8.7	80.0±8.3	81.6±6.9	81.2±8.3	72.7±8.0	82.3±7.7	83.2±6.8	77.1±8.9	80.4±8.4
(N)	(11)	(65)	(15)	(53)	(8)	(16)	(27)	(33)	(76)
p	NS**		<0.05*			<0.05*			

<sup>§</sup>SD notes standard deviation

<sup>§§</sup>OSI-MD notes Occupational Stress Index for Physicians

\*p of ANOVA, \*\* not significant by an unpaired *t*-test between genders.

**Table 2: Mean and SD<sup>§</sup> of workplace stressor aspect scores by physician groups**

Stressor aspect (N)	Physician groups			p*
	Physicians in surgical field (N)	Other physicians involved in patient care (N)	Physicians not involved in direct patient care (N)	
Under load (211)	7.6±2.1 (33)	7.7±1.8 (153)	7.6±1.4 (25)	NS**
High demand (192)	29.8±2.6 (33)	27.7±3.3 (152)	24.6±3.4 (7)	<0.05
Strictness (175)	14.0±1.6 (30)	12.8±1.1 (130)	10.1±1.6 (15)	<0.01
Extrinsic time pressure (191)	7.2±1.4 (31)	7.2±1.3 (143)	6.4±1.1 (17)	<0.05
Noxious exposures (140)	2.5±2.0 (22)	1.1±0.9 (102)	1.2±0.7 (16)	<0.01
Threat avoidance (154)	11.4±2.0 (25)	9.9±1.9 (117)	8.7±2.5 (12)	<0.01
Conflict/uncertainty (177)	14.3±2.8 (27)	14.4±2.2 (131)	13.7±1.7 (19)	NS

<sup>§</sup>SD notes standard deviation \*p of ANOVA, \*\* not significant.



**Table 3: Proportion of urban and rural physicians specifying selected stress elements as "present" or "strongly present"**

Elements	Urban physicians (N)	Rural physicians (N)	p*
Substantial need for sustained alertness to avoid serious consequences	78.3% (101)	65.2% (58)	<0.05
Lack of rest breaks	92.2% (118)	85.4% (76)	NS**
Hazardous task performance	80.8% (105)	75.3% (67)	NS
Inadequate pay	98.4% (127)	93.3% (83)	NS
Little or no control of task performance rate	41.3% (45)	43.8% (39)	NS
Frequently working overtime	65.4% (85)	83.1% (74)	<0.01
Frequently working under deadline pressure	83.2% (104)	64.0% (57)	<0.01

Note: \*p by chi-square test, \*\* not significant.

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