[Environmental Health and Preventive Medicine 10, 227–232, September 2005]

Original Article

Relationship between Job Stress and Self-Rated Health among Japanese Full-Time Occupational Physicians

Takashi SHIMIZU[1] and Shoji NAGATA[1]

[1]*Department of Mental Health, Institute of Industrial Ecological Sciences, University of Occupational and Environmental Health, Fukuoka, Japan*

Abstract

Objectives: We investigated relationships between job stress and self-rated health among Japanese full-time occupational physicians (OPs).

Methods: In 2000, we mailed self-administrated questionnaires to 716 OPs. Of these OPs, 349 (49%) returned sufficiently completed questionnaires for analyses. Oblique-rotated principal factor analysis of the job stress questionnaire extracted three components; low understanding of occupational health services in companies (low understanding), conflicts between occupational physicians and their coworkers (conflicts), and discrepancies between occupational physicians' routine work and occupational health services (discrepancies).

Results: The model, in which low understanding contributed to self-rated health through job satisfaction and self-rated health was influenced by job satisfaction and discrepancies, provided a good fit to the data.

Conclusions: We found that a potential relationship between job stress and self-rated health among Japanese full-time OPs. The present results implied that among full-time OPs, low understanding contributed negatively to self-rated health through job satisfaction, and that self-rated health was influenced positively by job satisfaction and negatively by discrepancies.

Key words: job stress, job satisfaction, self-rated health, occupational physicians, structural equation model

Introduction

The Japanese Labor Safety and Health Law states that the enterprises with one thousand or more employees should have at least one full-time occupational physician (OP) (1). It also states that the enterprises with three thousand or more employees should have at least two full-time OPs and that those with 50–999 employees should have at least one part-time OP. In Japan, there are approximately 2100 full-time OPs (2).

We think that Japanese full-time OPs have different psychological characteristics from general practitioners (GPs) in medical institutes because Japanese full-time OPs have two roles, both as an employee and as a health professional, and that they have different work content and environment from GPs. Japanese full-time OPs are employees of a company and perform their jobs through negotiation alongside the human resource section, finance section, front-line managers, middle-class managers, senior managers, and hospital physicians. In contrast, GPs perform their jobs alongside medical coworkers only. Japanese full-time OPs perform mainly health education, counseling according to health examination results, and comment on an employee's work content and environment, in contract to GPs who perform mainly treatment.

The work of full-time OPs is considered to be different in many ways from that of GPs, whose job stress, job satisfaction, and mental health have been investigated in many studies (4–13). In some studies, major sources of GPs' stress were largely related to time pressure, and ability to help patients, while poor relationships with work colleagues were major sources of job dissatisfaction (14). Other studies found that GPs' job satisfaction was based on three aspects of general practice such as clinical, psychosocial, and marginal (15), and that job stressors were predictive of high levels of job dissatisfaction and negative mental health (10, 16).

However, the psychological characteristics among Japanese full-time OPs have not been fully demonstrated (18, 19), and therefore we investigated the psychological characteristics among Japanese full-time OPs, focusing on job stress, job

Received Jan. 13, 2005/Accepted Jun. 20, 2005
Reprint requests to: Takashi SHIMIZU
Department of Mental Health, Institute of Industrial Ecological Sciences, University of Occupational and Environmental Health, 1-1 Iseigaoka, Yahatanishi-ku, Kitakyushu-City, Fukuoka 807-8555, Japan
TEL: +81(93)691-7475, FAX: +81(93)692-5419
E-mail: t-shimiz@nifty.com

satisfaction, and coping behaviors among Japanese full-time OPs (18, 19).

We found that Japanese full-time OPs had three unique types of job stress; stress related to low understanding of occupational health services (low understanding), conflicts between OPs and their coworkers such as managers and occupational health nurses (conflicts), and discrepancies between OPs' routine work and occupational health services (discrepancies). The stress was influenced by age, gender, and the number of employees (18).

Our study also indicated that the job satisfaction of Japanese full-time OPs was associated with age, and coping behaviors such as consultations with superiors or off-site supportive networks, communications in the company and the community, and work system improvement, which included classification of roles for occupational staff and the simplification of work (19).

In the present study, we hypothesized that job stress was associated with self-rated health among Japanese full-time occupational physicians. We studied job stress and self-rated health among Japanese full-time OPs to certify our hypothesis and to improve their psychological well-being.

Methods

We designed a questionnaire which included age, gender, marital status, job satisfaction, self-rated health, and job stress questions (18). A set of questions on job stress, consisting of 15 items identified as commonly experienced stress types in full-time OPs' routine work, were selected after discussion with ten experienced full-time OPs. It was amended after a pretest on several full-time OPs. The sample questions were "I have too much work." and "The bulk of my work is unrelated to the duties of occupational physicians." To every question in the job stress questionnaire, respondents were requested to indicate both the frequency and strength. An answer to the frequency of each item was selected from "0: never", "1: sometimes", and "2: frequently". An answer to the strength of the item was selected from "0: none", "1: somewhat", and "2: severely".

Job satisfaction was measured by the short scale with a four-point Likert type rating which ranged from "1: extremely dissatisfied" to "4: extremely satisfied".

Self-rated health, which was a valid health status indicator (20–22), also was measured by the short scale with a four-point Likert type which ranged from "1: very poor" to "4: very good".

In June 2000, we mailed a set of self-administrated questionnaires to 716 full-time OPs who were the registered members of "Sanyu-kai"; the only Japanese association of full-time OPs. We explained its purpose and contents and obtained their consent before our study, and we also obtained the permission for the present study from the ethical committee of "Sanyu-kai". Three hundred eighty-seven (54%) of the physicians had returned the questionnaires anonymously by the end of July, of these 349 (49%) were sufficiently complete for statistical analyses.

Statistical analysis

The job stress score (S scores) of the job stress questions was calculated by the square root of (frequency×strength). The promax-rotated principal factor analysis was performed in S scores of the questions to identify the job stress among Japanese full-time OPs. Excluding Q13 (family support) with lowest communality (0.10), the factor analysis extracted three components. Factor loadings over 0.35 were tentatively selected. Factor 1 consisted of 6 items which related to low understanding of occupational health services. Factor 2 consisted of 6 items which related to conflicts between OPs and their coworkers such as employees, managers, and community-based physicians. Factor 3 consisted of 3 items which related to discrepancies between OPs' routine work and occupational health services.

The score of each component which was low understanding of occupational health services (low understanding), conflicts between OPs and their partners (conflicts), or discrepancies between OPs' routine work and occupational health services (discrepancies) was defined as below;

The score of low understanding=$S_3+S_4+S_5+S_9+S_{10}+S_{15}$
The score of conflicts=$S_6+S_7+S_8+S_{10}+S_{11}+S_{14}$
The score of discrepancies=$S_1+S_2+S_{12}$
(i=Item number of the job stress questionnaire)

The above scores were the magnitude of three components of job stress among full-time Japanese OPs.

Referring to the previous indications, we hypothesized the research model in which low understanding influenced job satisfaction and self-rated health and discrepancies contributed to low self-rated health (Fig. 1). Some studies showed that job stressors such as practice administration and job demands, work/home interface and social life, routine medical work, working environment, and interruptions negatively influenced job satisfaction of GPs (10) and that professional stress of physicians contributed to poor work satisfaction (23). Other studies showed that mental health of GPs was influenced by job stress related to practice administration, job demands, and job satisfaction (10, 24). Among Japanese employees, Shigemi et al. (25) suggested that subjective job stress was significantly associated with the state of mental health and that the items of "too much trouble at work" and "poor relationship with superiors" were significantly related to mental health.

Structural equation analysis was used to certify our hypothesis about the relationship between job stress and self-rated health among full-time OPs.

Japanese full-time OPs were considered to have job stress

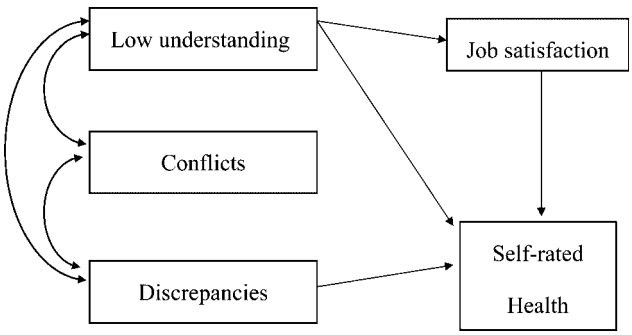

Fig. 1 Research model.

like GPs and workers whose job stress was influenced by relationships with their superiors. Job stress related to discrepancies was considered to be similar to job demands which influenced mental health.

The calculations were performed with the SPSS 10.0J or the Amos 4.0.

Results

Table 1 shows the characteristics of the respondents. The mean age was 49.1 (SD=13.4). Of them 82.5% were male, and 70.2% were extremely satisfied or satisfied with their jobs and 82.2% answered "very good" or "good" in self-rated health.

Table 2 shows the result of the promax-rotated principal factor analysis of the job stress score. Cronbach's alpha coefficient of the job stress questions excluding Q13 was 0.84 and those of subscales of low understanding, conflicts, and discrepancies were 0.80, 0.69, and 0.56, respectively.

We found high correlations among the scores of three types of job stress, and between job satisfaction and self-rated health. We also found that the score of low understanding had higher correlations with job satisfaction and self-rated health than the other scores of job stress (Table 3).

Because of the very small causal coefficient from low understanding to self-rated health in the research model (data not shown), we developed the revised research model with reference to the results of the factor analysis of the job stress score, and the correlations among three types of job stress, job satisfaction, and self-rated health (Fig. 2). In the model, the three job stresses were related to each other, and low understanding contributed to self-rated health indirectly through job satisfaction and discrepancies affected self-rated health directly.

After the AMOS tested the research model, the revised research model provided a better fit to the data than the initial

Table 1 Characteristics of the respondents

	Total
n	349
n (%)	
Male	288 (82.5)
Married	313 (89.7)
Age groups	
20–39	105 (30.1)
40–49	102 (29.2)
50–59	54 (15.5)
59<	88 (25.2)
Job satisfaction	
Extremely satisfied	22 (6.3)
Satisfied	223 (63.9)
Dissatisfied	74 (26.9)
Extremely dissatisfied	10 (2.9)
Self-rated Health	
Very good	103 (29.5)
Good	184 (52.7)
Poor	57 (16.3)
Very poor	5 (1.4)
Mean (SD)	
Age	49.1 (13.4)

Table 2 Promax-rotated principal factor loadings of the job stress questionnaire

Questions	Factor 1	Factor 2	Factor 3	Communality
S1	–0.10	0.10	**0.50**	0.25
S2	0.17	0.00	**0.62**	0.53
S3	**0.80**	–0.06	–0.05	0.57
S4	**0.58**	0.08	0.07	0.44
S5	**0.70**	–0.09	0.16	0.58
S6	0.31	**0.42**	0.02	0.40
S7	0.04	**0.58**	0.03	0.37
S8	–0.23	**0.59**	0.12	0.32
S9	**0.52**	–0.09	0.24	0.41
S10	**0.47**	**0.37**	–0.07	0.45
S11	0.09	**0.52**	0.09	0.38
S12	0.05	0.13	**0.40**	0.24
S14	0.33	**0.37**	–0.07	0.31
S15	**0.55**	0.05	–0.12	0.27

Interfactor Correlations

	Factor 1	Factor 2	Factor 3
Factor 1			
Factor 2	0.42		
Factor 3	0.52	0.36	

1) Bold-faced type shows factor loadings over 0.35.

Table 3 The correlation matrix of the background items and job stress among Japanese full-time occupational physicians

	1	2	3	4	5	6	7
1. Gender							
2. Marital status	–0.12*						
3. Age	–0.24**	0.26**					
4. Job satisfaction	–0.09	0.05	0.15**				
5. Self-rated health	–0.04	0.05	0.13*	0.43**			
6. Low understanding	0.15**	–0.02	–0.18**	–0.39**	–0.25**		
7. Conflicts	0.21**	–0.10	–0.23**	–0.21**	–0.20**	0.50**	
8. Discrepancies	0.08	–0.06	–0.35**	–0.18**	–0.23**	0.46**	0.40**

1) *: $p<0.05$
2) **: $p<0.01$
3) Low understanding=The score of "Low understanding of occupational health services"
4) Conflicts=The score of "Conflicts between occupational physicians and their partners"
5) Discrepancies=The score of "Discrepancies between occupational physicians' routine work and occupational health services"

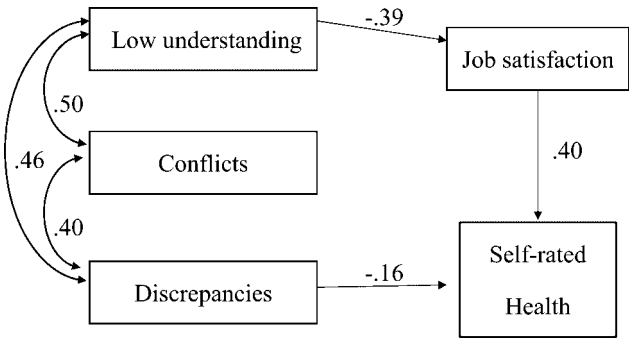

Fig. 2 Revised research model.

Table 4 Fit indices of the research model and the revised research model

	df	χ^2	p	AGFI	RMSEA	AIC
The research model	3	1.467	0.69	0.99	0.001	25.5
The revised research model	4	1.613	0.81	0.99	0.001	23.6

research model. The revised model showed that low understanding contributed to job satisfaction negatively, that discrepancies contributed to self-rated health negatively and that job satisfaction influenced self-rated health positively. Table 4 shows fit indices of the research model and the revised research model. The revised model resulted in a chi-square (df=4) of 1.613 (p=0.81, not significant), an Adjusted Goodness of Fit Index (AGFI) of 0.99, a root mean square error of approximation (RMSEA) of 0.001, of which 0.05 or less indicates a close fit the model in relation to degrees of freedom, and the Akaike information criterion (AIC) of 23.6, of which a low score indicated that it fit well to the data (26). The revised research model had higher fit indices than the research model.

Discussion

Our study was the first investigation for relationships among job stress, job satisfaction, and self-rated health of Japanese full-time OPs.

The three components of job stress such as low understanding of occupational health services in companies, conflicts between occupational physicians and their coworkers, and discrepancies between OPs' routine work and occupational health services were extracted by factor analysis. This result is compatible with the previous studies, which showed that the main sources of stress of GPs were uncertainty and insecurity about work, isolation, poor relationship with other doctors, disillusionment with the role of the general practice, and an awareness of changing demands (15). Also factor analysis of work stress of GPs highlighted new contract demands such as organizational management changes and communicating with health service managers, working with practice staff, and non-clinical routine (27).

Our results indicated that job satisfaction of full-time OPs is mainly influenced by the understanding of occupational health services in their companies. This is considered reasonable because most OPs have a role as employees whose jobs tend to be affected by the understanding of their superiors. If they have managers with a higher understanding of occupational health services, they are more likely to perform the services affirmatively and to have higher job satisfaction.

We found that OPs' job satisfaction contributed positively to their self-rated health. This finding was compatible with previous studies which showed that self-rated health was one of health status indicators, including psychological health status, which was affected by job satisfaction.

Our results suggested that discrepancies also had a negative effect on self-rated health. This was considered reasonable because routine work unrelated to occupational health services, that is, meaningless task for OPs, caused the OPs considerable stress and lead to poor self-rated health.

The present study had three limitations. First was that the participants of our study only represented those Japanese full-time OPs who had joined the Japanese association of OPs voluntarily. As members, they were considered to have a positive attitude to performing occupational health services affirmatively. This tendency showed a typical relationship between job stress and self-rated health of full-time OPs. Second was that the final response rate was 47%, which means that the selection bias cannot be completely removed. Further studies should investigate the relationship between them by a larger sample size and higher response rate. Third was a limitation of the validity of the job stress questions, although the internal consistency reliability of the job stress questions was considered to be acceptable because its Cronbach's alpha coefficient was high (28). We discussed its validity previously (18). However, further studies should certify these questions' validity with reference to our results.

In conclusion, we found that a potential relationship between job stress and self-rated health among Japanese full-time OPs. Our results implied that among full-time OPs low understanding contributed negatively and indirectly to self-rated health through job satisfaction, while discrepancies affected self-rated health negatively and directly. The implications are that increased the understanding of occupational health services in companies should be encouraged, while at the same time decreasing the number of unrelated jobs to be carried out by OPs, in order to improve the self-rated health of Japanese full-time OPs.

Acknowledgements

This study was supported by "Sanyu-Kai", an association of Japanese full-time occupational physicians in enterprises. The authors gratefully acknowledge the kind assistance of Drs. Eitoku Shoji and Kazuhiko Hirobe.

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Appendix

The job stress questionnaire

Q1. I have too much work.
Q2. The bulk of my work is unrelated to the duties of occupational physicians.
Q3. Most managers are indifferent to occupational health services in my company.
Q4. I have little support or networks to solve work-related problems.
Q5. I suffer from an ambiguity about my own role and position within my company.
Q6. I cannot gain the understanding of the human resources personnel and other managers on the placement of return-to-work employees.
Q7. I cannot gain the understanding or cooperation of the general practitioners treating return-to-work employees on their most appropriate placement.
Q8. Problems concerning employees over health management have occurred.
Q9. The boss undervalues the performance of my work.
Q10. Managers are indifferent to the opinions of occupational physicians regarding improvements in work conditions and environment.

Q11. I feel a conflict between the responsibility for safety and health of the employees and the protection of their privacy.
Q12. There is conflict among other occupational service staff.
Q13. My family have only a limited understanding of my work and fail to support me.
Q14. I cannot obtain clear results on activities to support employees' health.
Q15. I cannot join the annual planning sessions.