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## Association of Self-Rated Health with Job Stress and Acute Stress Reactions in Japanese Workers

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### Abstract

**Aim:** In the recent years, strategies for preventing job stress related diseases have been drawing much attention, and the role of occupational health nurses is now viewed as extremely important. The objective of this study was to identify the association between self-rated health, job stress and acute stress reactions among workers.

**Methods:** Self-administered questionnaires were mailed to 434 employees working for 9 enterprises in north Japan in December, 2004. Three hundred forty seven responses were returned (response rate – 80.0%). Acute stress reactions and job stressors were measured using the NIOSH General Job Stress Questionnaire, and their association with self-rated health was analyzed.

**Results:** In men, self-rated health had weak correlations with the three scales of acute stress reactions. In females, self-rated health had moderate correlations with depression and somatic complaints. In both men and women, no correlations were found between subjective health and the three scales of job stressors.

**Conclusion:** Self-rated health provides important information for decreasing and preventing mental health problems in the workplace. Therefore, it should be widely used in developing occupational health strategies.

**Key words:** Self-rated health, job stress, acute stress reactions, occupational health, occupational health nurse

### 1. INTRODUCTION

In the recent years, working environments in Japan have undergone considerable changes, causing stress and mental health problems among workers. Mental health in the workplace poses a complicated problem for occupational health nursing<sup>1)</sup>. The role of occupational health nurses in preventing job stress related diseases and dealing with them at early stages is now viewed as extremely important<sup>2)</sup>. The association between job stress factors and adverse health effects have been examined by a number of studies using job stress models

such as the Job Demands-Control model, the NIOSH General Job Stress model, the Effort-Reward Imbalance model, etc<sup>3-5</sup>).

Self-rated health is an indicator widely used in various studies<sup>6</sup>. It is measured using a single question, as follows: "In general, would you say your health is very good, rather good, rather poor or very poor?" The answer choices can vary in number. Self-rated health is viewed as an important predictor of illness, mortality, etc. For instance, poor self-rated health is reported to increase risk of mortality from cardiovascular disease and other diseases<sup>6</sup>. A number of foreign studies have found that job stress leads to low self-rated health status<sup>10,11</sup>) In Japan, research of self-rated health is rather limited<sup>12</sup>). As self-rated health is considered to differ by culture and nationality<sup>6</sup>), we need more to be done in Japan to explore this important issue. In our previous study, we found workload perception to be related to acute stress reactions<sup>13</sup>). In this study, we examined the association of self-rated health with job stress and acute stress reactions in Japanese workers.

## II. METHODS

### Subjects

The subjects were 434 employees working for 9 enterprises in north Japan that had occupational health nursing staff. The enterprises included two manufacturing companies, two public offices, two carrier companies, one finance company, one service company, and one research institute.

### Data collection

In December, 2004, self-administered questionnaires were mailed to 50 subjects at each enterprise, except one enterprise where the questionnaires were distributed to 34 subjects. Three hundred forty seven responses were returned (response rate – 80.0%). The data of 327 persons (239 men and 88 women) were analyzed, invalid responses excluded.

### Measures

The questionnaire on self-rated health was based on the five-choice method. The subjects were asked to rate their present state of health as "very good", "rather good", "normal", "rather poor", and "very poor".

Acute stress reactions were measured using the Japanese Version of the NIOSH General Job Stress Questionnaire, known for its reliability and validity<sup>14</sup>). Three scales – depression (20 items, 0–60 scores), job satisfaction (4 items, 4–13 scores), and somatic complaints (17 items, 17–85 scores) were used to measure acute reactions. Quantitative workload scale (4 items, 4–20 scores), cognitive demands scale that reflects mental work (5 items, 5–20 scores), and intragroup conflict scale (8 items, 8–40 scores) were used to measure job stressors. Higher scores indicated higher stress levels, except job satisfaction scale. Fifteen scores and more for depression scale were defined as depression. We calculated separately the scores for somatic complaints scale and job satisfaction and then divided them into tertils to define low, medium,

and high levels for each scale.

### Statistical analysis

The  $\chi^2$ -tests were used to evaluate whether there were gender differences in characteristics and self-rated health. Spearman rank correlation was used to analyze the associations between self-rated health, the scores for the three stressor scales and the scores for the three acute stress reaction scales. The strength of the associations was assessed according to the correlation coefficients<sup>15)</sup>. Logistic regression analysis was performed to examine whether there were acute stress reactions differences in poor self-rated health. The odds ratio and 95% confidence were calculated. Possible confounding factors included in the logistic regression models as independent variables were age and occupational categories. Two-tailed values of less than 0.05 were considered statistically significant. All the analyses were conducted using SPSS software Version 12 for Windows.

### Ethical considerations

The protocol of this study was reviewed and accepted by the Board of Ethics for Medical Studies, Graduate School of Medicine and School of Medicine, Hokkaido University, acquired in September, 2004.

## III. RESULTS

Table 1 shows the characteristics of the subjects by gender. There were significant gender differences in age groups and occupational categories. Self-rated health by age is represented in Table 2. The group in their 40s had the highest percentage of poor self-rated health (combining “rather poor” and “very poor”), men making up 29.3% and women – 43.8%.

**Table1.** Characteristics of the subjects by gender

	Men		Women		P-value
	n	%	n	%	
Age group (years)					
30<	20	8.4	24	27	<0.001
30-39	70	29	35	40	
40-49	58	24	16	18	
50≥	91	38	13	15	
Total	239	100	88	100	
Occupational category					
Clerical workers	103	45	67	77.0	<0.001
Professionals	27	12	14	16	
Technicians	34	15	3	3.4	
Managers	36	16	0	0.0	
Laborers/Operators	22	9.5	1	1.2	
Service workers	7	3.0	2	2.3	
Others	2	0.9	0	0.0	
Total	231	100	87	100	
Self-Rated Health					
very good	13	5.4	5	5.7	0.643
rather good	85	36	38	43	
normal	97	41	24	27	
rather poor	39	16	20	23	
very poor	5	2.1	1	1.1	
Total	239	100	88	100	

**Table2.** Self-Rated Health by age

	30<		30~39		40~49		50≥		P-value
	n	%	n	%	n	%	n	%	
Men (n=239)									
very good	0	0.0	8	11.4	4	6.9	1	1.1	0.093
rather good	8	40.0	22	31.4	18	31.0	37	40.7	
normal	10	50.0	26	37.2	19	32.8	42	46.1	
rather poor	2	10.0	13	18.6	14	24.1	10	11.0	
very poor	0	0.0	1	1.4	3	5.2	1	1.1	
Total	20	100	70	100	58	100	91	100	
Women (n=88)									
very good	2	8.3	1	2.9	2	12.5	0	0.0	0.405
rather good	13	54.2	16	45.7	4	25	5	38.5	
normal	4	16.7	12	34.3	3	18.7	5	38.5	
rather poor	5	20.8	6	17.1	6	37.5	3	23.0	
very poor	0	0.0	0	0.0	1	6.3	0	0.0	
Total	24	100	35	100	16	100	13	100	
Total (n=327)									
very good	2	4.6	9	8.5	6	8.1	1	1.0	0.057
rather good	21	47.7	38	36.2	22	29.7	42	40.3	
normal	14	31.8	38	36.2	22	29.7	47	45.2	
rather poor	7	15.9	19	18.1	20	27.1	13	12.5	
very poor	0	0.0	1	1.0	4	5.4	1	1.0	
Total	44	100	105	100	74	100	104	100	

The associations between self-rated health and acute stress reactions are represented in Table 3. Self-rated health in men had weak correlations with depression, somatic complaints, and job satisfaction. Self-rated health in women had moderate correlations with depression and somatic complaints. The associations between self-rated health and job stressors are represented in Table 4. In both men and women, there were no correlations with any of the three scales of job stressors.

**Table3.** Associations between Self-Rated Health and acute stress reactions

	n	Depression		Somatic complaints		Job satisfaction		
		r	P-value	r	P-value	r	P-value	
Self-Rated Health	Men	239	0.29	<0.001	<b>0.36</b>	<0.001	-0.29	<0.001
	Women	88	<b>0.41</b>	<0.001	<b>0.40</b>	<0.001	-0.08	0.486
	Total	327	0.32	<0.001	<b>0.36</b>	<0.001	-0.220	<0.001

Correlation coefficients of 0.35 and more shown in bold

**Table4.** Assosiations between Self-Rated Health and job stressors

	n	Quantitative workload		Cognitive demands		Intragroup conflict		
		r	P-value	r	P-value	r	P-value	
Self-Rated Health	Men	239	0.11	0.086	0.10	0.115	0.12	0.072
	Women	88	0.20	0.069	0.15	0.172	0.16	0.143
	Total	327	0.13	0.016	0.17	0.038	0.13	0.018

Correlation coefficients of 0.35 and more shown in bold.

Table 5 shows odds ratios and 95% confidence for poor self-rated health according to acute stress reactions. In men and women, the high depression group showed a significantly high prevalence OR of being in the poor self-rated health group, compared to the low depression group. In men and women, the high somatic complaints group showed a significantly high prevalence OR of being in the poor self-rated health group, compared to the low somatic complaints group, before and after adjustment.

**Table5.** Odds ratios and 95% confidence for Self-Rated Health according to acute stress reactions

	n(%)	Unadjusted OR(95%CI)	P-value	Adjusted OR(95%CI)	P-value
Men (n=239)					
Depression					
Normal	193 (81.4)	1.00		1.00	
Depression	44 (18.6)	2.54 (1.30-4.94)	0.006	2.52 (1.22-5.19)	0.012
Somatic complaints					
Low & Medium	176 (73.6)	1.00		1.00	
High	63 (26.4)	4.80 (2.41-9.56)	<0.001	5.03 (2.40-10.51)	<0.001
Job dissatisfaction					
Low & Medium	180 (77.9)	1.00		1.00	
High	51 (22.1)	0.61 (0.26-1.47)	0.613	0.57 (0.22 1.44)	0.234
Women (n=88)					
Depression					
Normal	53 (60.2)	1.00		1.00	
Depression	35 (39.8)	4.38 (1.54-12.44)	0.006	5.05 (1.70-15.00)	0.004
Somatic complaints					
Low & Medium	51 (58.0)	1.00		1.00	
High	37 (42.0)	2.91 (1.06-8.01)	0.039	2.89 (1.02-8.19)	0.046
Job dissatisfaction					
Low & Medium	67 (76.1)	1.00		1.00	
High	21 (23.9)	0.23 (0.03-1.88)	0.170	1.09 (0.86-1.40)	0.472

NOTE: Adjusted by age and occupational class.

#### IV. DISCUSSION

In this study, men and women who reported to be rather healthy or very healthy comprised more than 40% of all respondents, while approximately 20% felt their health to be rather poor or very poor. These results are close to the results by Toyokawa et al<sup>12)</sup>. In their 4-step research of self-rated health among 32,014 employees at 1 enterprise, 17.3% of men and 19.6% of women reported their health as poor. This study identified the group in their 40s as having the highest percentage of poor self-rated health, with women comprising as much as 43.8%. Toyokawa et al<sup>12)</sup>, on the other hand, found no difference in self-rated health by age, and the number of women in their 40s with poor self-rated health was low, compared to our results, with 12.9% among clerks and 21.2% among sales workers. This discrepancy in the results might have been caused by the differences of targeted enterprises and occupational categories in this research and the research by Toyokawa.

Kagamimori<sup>16)</sup>, in his research of subjective mental and physical health in Japanese workers, found that physical QOL grew worse with age, while mental QOL was low in the persons in their 30s. Besides, women appeared to have low mental QOL, and managers a high mental QOL<sup>16)</sup>. Relations between poor self-rated health and confounding factors need further study.

Concerning the association between self-rated health and job stressors, no correlations with any of the three scales (quantitative workload, cognitive demands, and intragroup conflict) were found either in men or in women. Job stressors in general include various factors such as excessive workload and responsibility, unsatisfactory relations with superiors and co-workers, role conflict, working conditions, physical environment, etc<sup>17)</sup>. Thus, the results of this study are insufficient to say that self-rated health has no association with job stressors. Apart from job-related factors, there is a wide range of non-job-related factors, such as family and social life, presence or absence of diseases, etc., that may influence the ways people feel about their health. It is especially true about Japanese working women, who are often responsible for most of the housework and childcare and, thus, get exposed to a lot of stress outside the workplace<sup>18, 19)</sup>.

In this study, self-rated health had weak correlations with depression, somatic complaints, and job satisfaction in men, and moderate correlations with depression and somatic complaints in women. These results demonstrate the association between self-rated health and acute stress reactions. The possibility is that workers who feel their health to be rather poor or very poor are developing some kind of acute stress reactions. That might be applied especially to women who showed a stronger association between self-rated health and depression than men. Hallman et al.<sup>20)</sup> have reported that women, compared to men, are more sensitive to psychosocial factors and their self-rated health to a larger extent depends on psychological influence. The results of this study, on the other hand, suggest that workers' self-rated health is to a great extent related to depression, somatic complaints, and other acute reactions.

Self-rated health can provide important information on acute stress reactions, which is vital for improving QOL in the workplace, as well as for conducting health promotion among workers to develop their self-care skills and healthy life-style habits<sup>21)</sup>. Self-rated health should

be widely used in developing strategies for decreasing and preventing adverse health effects caused by stress, which has become a serious issue for occupational medicine. The role of occupational health nurses in collecting and efficient utilization of information on self-rated health is now viewed as extremely important<sup>13)</sup>.

Before making a conclusion, we have to refer to several limitations of the study. The number of women participating in this study was small. As the proportion of working women is growing and their occupational environments differ depending on their jobs, further study using a larger sample of subjects is necessary. The study was limited to north Japan, and the characteristics of region might have influenced the results. There is also the need to conduct intervention research aimed at decrease and prevention of acute stress reactions.

## V. CONCLUSION

This study identified the association of self-rated health with job stress and acute stress reactions in Japanese workers. Self-rated health in both men and women had associations with depression and somatic complaints, with weak correlations in men and moderate correlations in women. These results suggest that poor self-rated health is connected with strong acute stress reactions.

Self-rated health provides important information for decreasing and preventing mental health problems in the workplace. Therefore, it should be widely used in developing occupational health strategies.

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