

Original

Surveys on minimum practical abilities required by nonspecialist occupational physicians in Japan

Masako Nagata¹, Koji Mori^{1,2}, Asako Ishikawa¹ and Tomohisa Nagata²

¹Occupational Health Training Center, University of Occupational and Environmental Health, Japan and ²Department of Occupational Health Practice and Management, University of Occupational and Environmental Health, Japan

Abstract: Objectives: This study aimed to identify the practical abilities required by nonspecialist occupational physicians and specify the priorities for training programs. **Methods:** A practical abilities list was developed through a focus group meeting of specialists. We created a survey questionnaire and asked three groups, namely, occupational physicians, occupational health nurses, and health officers, to rate the importance of each practical ability. **Results:** The mean scores for all 45 items were greater than 4, i.e., in the middle of the 7-point Likert scale, for all the three groups. The occupational physicians' responses had a correlation with the other groups' responses. However, there were differences with regard to some practical abilities between the three groups. Five practical abilities from the top quartile were marked "A" by all the three groups: "Submit opinions on fitness for duty and work accommodation on the basis of data from health examination," "Respect employee privacy," "Submit opinion on fitness for duty and work accommodation on the basis of data from face-to-face interviews with employees," "Submit opinions on fitness for duty and work accommodation on the basis of data from health surveillance," and "Implement face-to-face interviews for employees who have worked overtime and evaluate the subjects' conditions including mental and physical health status, degree of accumulated fatigue, and depression." **Conclusions:** This study resulted in a rank-ordered list of 45 practical abilities that are required by nonspecialist occupational physicians. This result may be useful to review and redesign the existing training program for nonspecialist occupational physicians.

(J Occup Health 2016; 58: 276-288)

Received August 14, 2015; Accepted February 26, 2016

Published online in J-STAGE April 22, 2016

Correspondence to: M. Nagata, Occupational Health Training Center, University of Occupational and Environmental Health, 1-1 Iseigaoka, Yahatanishi-ku, Kitakyushu, 807-8555, Japan (e-mail: m-nagata@med.uoeh-u.ac.jp)

doi: 10.1539/joh.15-0224-OA

Key words: Nonspecialist occupational physicians, Minimum practical abilities, Training curriculum

Introduction

The World Health Organization (WHO), International Labour Organization, and International Conference Occupational Health have launched a joint effort to develop the basic occupational health service (BOHS) policy and guidelines to improve occupational health services coverage worldwide¹. According to the BOHS policy, most BOHSs are provided by nonspecialists, usually a physician and nurse, who have received a short training in occupational health. Moreover, occupational health services cannot be provided without receiving a minimum amount of special training in occupational health services essential element and methods¹. To ensure the provision of BOHS, it is vitally important to secure sufficient personnel, including physicians and nurses.

The training systems of occupational physicians significantly vary among countries². While only physicians who complete four years of postgraduate training to work as an occupational physician^{3,4}, in some countries, short postgraduate courses are provided for physicians working as part-time occupational physicians⁵.

In Japan, occupational health services in a worksite with 50 or more employees are provided by occupational physicians. These services are required by law and can be considered equivalent to BOHS. Occupational physicians are required by law to complete a minimum training⁶.

There are two main training programs for occupational physicians in Japan. The Japan Medical Association provides the typical 50-h training program for nonspecialist occupational physicians, and more than 80,000 doctors have completed this program⁷. Alternatively, the Japan Society for Occupational Health and the University of

Occupational and Environmental Health provide courses to train specialist occupational physicians^{8,9)}. The number of graduates who have completed these courses is still limited, and less than 500 doctors have been certified as specialist occupational physicians by the Japan Society for Occupational Health.

Nonspecialist occupational physicians spend most of their working hours in other specialties and typically provide occupational health services for half a day per week¹⁰⁾. However, the number of service hours provided by nonspecialist occupational physicians total an estimated 2,592,000 h per year, which is equivalent to 70 times the total number of hours provided by specialist occupational physicians¹⁰⁻¹²⁾. Nonspecialist occupational physicians usually provide BOHSs on the basis of regulations.

As in other developed countries¹³⁻¹⁵⁾, the occupational health service needs have also changed in Japan, and occupational physicians are expected to play an important role in various situations. In the recently revised law, new expectations of occupational physicians such as execution of face-to-face interviews with overworked employees were added¹⁶⁾. Therefore, it is important to redesign training programs for nonspecialist occupational physicians to maintain the average quality of occupational health services in Japan through limited training opportunities.

Occupational health services are usually provided by multidisciplinary teams. In Japan, the assignment of health officers is a legal requirement for an employer at worksites where an occupational physician is assigned. Occupational health nurses often work with occupational physicians. Therefore, health officers and occupational health nurses as well as occupational physicians should evaluate the abilities required by nonspecialist occupational physicians.

In this study, to clarify the minimum practical abilities required by nonspecialist occupational physicians and identify the priorities for training programs, we developed a questionnaire on the necessary practical abilities of nonspecialist occupational physicians and conducted questionnaire surveys on three groups: occupational physicians, occupational health nurses, and health officers.

Methods

Development of the questionnaire and list of the necessary practical abilities of nonspecialist occupational physicians

To create the survey questionnaire, we first developed a list of the necessary practical abilities required by occupational physicians. For this, we established a focus group consisting of six specialist occupational physicians with more than 10 years of experience in providing occupational services at small- and medium-sized enterprises. We then conducted a focus group meeting. The specialist

occupational physicians were asked to list as many practical abilities as possible that are needed for nonspecialist occupational physicians to achieve their legal roles. Then, each of the listed abilities was examined to determine if it could be broken down further. In total, 195 items were elicited.

In the second step, we reviewed the list and merged some of the practical abilities on the basis of the categories of occupational health services from a training program developer's point of view. We then developed phrases that presented the abilities in a unified and more understandable format for the survey. Finally, we agreed on a list with 45 occupational health practical abilities (Table 2).

We developed a questionnaire that asked about the necessity of each ability using a Likert scale of 1 to 7 (1: unnecessary, 4: moderately necessary, 7: absolutely necessary) and added some questions about the experiences of responders in occupational health fields.

Surveys on necessary practical abilities for nonspecialist occupational physicians

We conducted separate surveys for occupational health nurses and health officers as well as specialist occupational physicians who usually cooperatively work as a multidisciplinary team in occupational health practices at workplaces in Japan.

In the survey of specialist occupational physicians (survey 1), we sent the questionnaire to 158 occupational physicians certified by the Japan Society for Occupational Health. As specialists, these occupational physicians offer a wide range of occupational health services and understand their legal requirements.

In the survey of occupational health nurses (survey 2), we used the list of occupational health nurses registered by the Japan Society for Occupational Health Bureau of Occupational Health (registered nurses). These nurses provide occupational health services in cooperation with occupational physicians and consistently make efforts to promote their ability. We sent the same questionnaire to 144 registered nurses who resided in the Kyushu island because of convenience and to achieve an adequate number of participants.

We conducted the survey of health officers (survey 3) via the internet as an appropriate list of health officers was not available. The survey was implemented using a private marketing research company, GMO Research, Inc. (<http://www.gmo-research.jp/>). The participants, obtained from an online panel sample, were rewarded for completing the questionnaire according to the standards of the online panel company: they received panel points that could be exchanged for gift coupons. The points that each participant received for completing this questionnaire were worth 100 JPY. A random sample of 4,000 Japanese adults who were registered as being a work of

administrative part were invited and asked to rate the necessity of each practical ability from a list that was identical to the list included in the survey of specialist occupational physicians. There were two eligibility criteria: 1) to be a certified health officer and 2) to be, or have been, in charge of health management duties.

All surveys were conducted between September and October 2013.

Data Analysis

We evaluated the necessity of each competency by calculating its mean score across the three respondent groups. The correlation between the occupational physician group's rankings and the others' rankings was examined using the Spearman rank correlation coefficient.

A one-way ANOVA test was used to determine whether there were any significant differences in the mean scores of each practical ability between the groups. There were significant differences in the mean scores of some practical abilities, although the rankings of the items between the three groups were close. For example, the ranks of the third item were as follows: first in the occupational physician group, second in the health officer group, and second in the occupational health nurse group. Therefore, we did not compare the mean score of each practical ability between the groups. We classified the 45 items into quartile categories on the basis of each practical competency list. Data analysis was conducted using SPSS 19 for Microsoft Windows.

Ethical Considerations

The research procedures were approved by the ethical review committee at the University of Occupational and Environmental Health, Japan. We obtained the list of certified occupational physicians from the secretary's office of the certification program, following the official procedures of the Japan Society for Occupational Health. The list was destroyed once the study was completed. We conducted an anonymous self-administered questionnaire.

Results

For survey 1, we received 103 responses (response rate, 65.2%) and used 90 responses in the analysis after excluding 13 incomplete responses. For survey 2, we had 51 valid responses (response rate, 41.0%) after excluding nine incomplete responses. For survey 3, among the 1,973 responses (response rate, 49.3%), 215 were extracted as eligible according to the inclusion criteria and 202 were used for analysis after excluding the incomplete responses. All industry sectors were represented (Table 1).

The mean scores of all the practical abilities were ordered by categories and are shown in Table 2. The correlation coefficient between the specialist occupational phy-

sician group's rankings and the health officer group's rankings was 0.64, and that between the occupational physician group's rankings and the occupational health nurse group's rankings was 0.85. The occupational physician group's rankings have a correlation with the other group's rankings; the occupational health nurses' rankings were stronger than that of the health officers.

In the survey of specialist occupational physicians (survey 1), the mean scores for all practical abilities were greater than 4, i.e., "moderately necessary." The highest mean score reported by occupational physicians was 6.8, and the lowest mean score was 4.7. In the survey of occupational health nurses (survey 2), the mean scores for all practical abilities were greater than 5. The highest mean score reported by occupational health nurses was 6.8, and the lowest mean score was 5.2. In the survey of health officers (survey 3), the mean scores for all practical abilities were greater than 4, i.e., "moderately necessary." The highest mean score reported by health officers was 6.0, and the lowest mean score was 4.6. As a result, the mean scores for all 45 practical abilities were greater than 4, in the middle of the 7-point Likert scale, for all the three groups.

The abilities, which were listed in descending order of rank according to the occupational physicians' responses, are shown in Table 3. The top quartile of each respondent group is marked A, the second quartile is marked B, the third quartile is marked C, and the bottom quartile is marked D. Five practical abilities in the top quartile were marked "A" by all the three groups: 3) "Submit opinions on fitness for duty and work accommodation on the basis of data from health examination," 4) "Respect employee privacy," 12) "Submit opinion on fitness for duty and work accommodation on the basis of data from face-to-face interviews with employees," 15) "Submit opinions on fitness for duty and work accommodation on the basis of data from health surveillance," and 11) "Implement face-to-face interviews for employees who have worked overtime and evaluate the subjects' conditions including mental and physical health status, degree of accumulated fatigue, and depression." Alternatively, three practical abilities in the bottom quartile were marked "D" by all the respondent groups: 36) "Evaluate the implemented occupational health training," 25) "Provide advice to an employer about appropriate use of tools," and 20) "Provide advice to an employer on planning and implementing working environmental measurements."

To identify if there were significant differences between the responses of the occupational physician group and occupational health nurse group as well as between the occupational physician group and health officer group, the quartiles of each group of practical abilities were compared. Among the items in the top quartile of the occupational physician group list, no item was in the lower half of the occupational health nurse group list.

Table 1. Demographic and employment characteristics of survey respondents

			n	(%)
occupational health physician (n=90)	gender	male	53	58.9
		female	37	41.1
	age	20-29	0	0.0
		30-39	55	61.1
		40-49	26	28.9
		50-59	8	8.9
		60-	1	1.1
	years of experience	-10	57	63.3
		10-20	28	31.1
		20-	5	5.6
	Industry sector of experience	agriculture, forestry and fishing and mining	4	4.4
		construction	16	17.8
		manufacturing	78	86.7
		utility	17	18.9
traffic/telecommunication		34	37.8	
wholesale trade/retailing		24	26.7	
banking/insurance business		14	15.6	
service business		36	40.0	
medical welfare		16	17.8	
public office		20	22.2	
other	8	8.9		
occupational health nurse (n=51)	gender	male	1	2.0
		female	50	98.0
	age	20-29	1	2.0
		30-39	3	5.9
		40-49	28	54.9
		50-59	17	33.3
		60-	2	3.9
	years of experience	-10	7	13.7
		10-20	17	33.3
		20-	27	52.9
	Industry sector of experience	agriculture, forestry and fishing and mining	2	3.9
		construction	8	15.7
		manufacturing	31	60.8
		utility	6	11.8
traffic/telecommunication		10	19.6	
wholesale trade/retailing		6	11.8	
banking/insurance business		7	13.7	
service business		12	23.5	
medical welfare		9	17.6	
public office		10	19.6	
other	5	9.8		

(continued)

Table 1. Demographic and employment characteristics of survey respondents (continued)

			n	(%)
Health officer (n=202)	gender	male	172	85.1
		female	30	14.9
	age	20-29	11	5.4
		30-39	31	15.3
		40-49	72	35.6
		50-59	69	34.2
		60-	19	9.4
		Class-1 Health Officer	149	73.8
		Class-2 Health Officer	53	26.2
	Industry sector	agriculture, forestry and fishing and mining	2	1.0
		construction	17	8.4
		manufacturing	58	28.7
		utility	8	4.0
traffic/telecommunication		20	9.9	
wholesale trade/retailing		17	8.4	
banking/insurance business		15	7.4	
service business		46	22.8	
medical welfare		10	5.0	
public office		2	1.0	
other	8	4.0		

However, one item was in the lower half of the health officer group list: 40) "Properly implement field patrols and identify and evaluate existing health hazards at the workplace." Among the items with a mean score ranked in the lower half by the occupational physician group, no item was in the top quartile of the occupational health nurse group list and only one item was in the top quartile of the health officer group list: 10) "Recommend face-to-face interviews for employees who have worked overtime." Among the items with a mean score in the bottom quartile of the occupational physician group list, no item was in the upper half of the occupational health nurse group list. However, four items were in the upper half of the health officer group list: 42) "Provide advice to an employer to run the health committee efficiently," 2) "Interview and examine subjects undergoing periodic general health examination," 33) "Participate in measures about health promotion program for employees," and 19) "Provide advice to an employer regarding questionnaire surveys on mental health such as the stress survey, with reference to planning, implementation, analysis of the results, and plans for improvement."

As no significant differences in the quartiles of all practical abilities of the occupational physician group and occupational health nurse group were observed, we com-

pared the rankings of each practical ability between these groups to identify the small differences. Six practical abilities that were ranked by each group differed by more than 10. The items that were ranked higher by the occupational physicians than the occupational health nurses were: 1) "Provide advice to an employer on planning periodic general health examination," 4) "Conduct health guidance for employees on the basis of health examination," 5) "Provide advice to an employer on planning health surveillance," 32) "Perform health education for employees," and 45) "Properly maintain records including general health examination and interview." The item that was ranked higher by the occupational health nurses than the occupational physicians was: 29) "Implement face-to-face interview with employees, and submit opinions on fitness for duty and work accommodation for handicapped employees."

Discussion

The purpose of this study was to identify the practical abilities required by nonspecialist occupational physicians and to specify the priorities for training programs. For this survey, we developed a list of 45 practical abilities that are necessary for nonspecialist occupational physi-

Table 2. Necessity of practical abilities for non-specialist occupational physicians

	Occupational physician group		Health officer group		Occupational health nurse group		<i>p</i> -value**			
	mean scores	SD	rank	mean scores	SD	rank				
Periodic general health examination										
1	5.68	1.39	19	5.81	1.29	8	5.82	1.31	29	0.71
2	5.01	1.80	39	5.56	1.51	19	5.78	1.38	31	0.01
3	6.80	0.43	1	5.99	1.18	2	6.78	0.54	2	0.00
4	6.10	1.02	11	6.00	1.19	3	5.98	1.05	22	0.74
Health surveillance										
5	5.69	1.30	17	5.47	1.44	25	5.78	1.42	30	0.23
6	5.20	1.50	37	5.33	1.53	31	5.92	1.34	25	0.02
7	6.37	0.97	5	5.55	1.46	18	6.69	0.58	3	0.00
8	6.14	1.15	8	5.62	1.48	13	6.61	0.72	5	0.00
Measures to prevent adverse health effects due to overwork										
9	6.02	1.01	13	5.82	1.29	6	6.37	0.87	9	0.01
10	5.53	1.09	25	5.80	1.26	9	5.90	1.14	26	0.13
11	6.20	0.91	7	5.84	1.26	5	6.39	0.94	10	0.00
12	6.41	0.83	4	5.83	1.24	7	6.69	0.68	4	0.00
Mental health measures										
13	5.46	1.30	27	5.58	1.26	14	6.25	0.74	13	0.00
14	5.59	1.35	22	5.55	1.29	17	6.24	0.71	14	0.00
15	6.37	0.81	6	5.77	1.30	10	6.59	0.67	6	0.00
16	6.48	0.84	3	5.68	1.31	12	6.82	0.43	1	0.00
17	5.40	1.20	28	5.51	1.35	22	5.84	1.05	27	0.13
18	5.10	1.30	38	5.43	1.32	26	5.61	0.94	35	0.04
19	4.89	1.43	42	5.52	1.30	21	5.84	1.07	28	0.00
20	4.89	1.56	43	5.13	1.36	40	5.31	1.30	43	0.20

(continued)

Table 2. Necessity of practical abilities for non-specialist occupational physicians (continued)

	Occupational physician group		Health officer group		Occupational health nurse group		<i>p-value</i> *			
	mean scores	SD	rank	mean scores	SD	rank				
21 Evaluate the results of the working environmental measurements, provide advice to an employer on necessary measures.	5.64	1.43	20	5.18	1.36	39	5.96	1.34	24	0.00
Protective equipment and work design										
22 Provide advice to an employer on the usage and maintenance of the personnel equipment.	5.32	1.40	33	4.84	1.53	44	5.47	1.21	40	0.00
23 Provide advice to an employer on management of working time.	5.30	1.32	34	5.05	1.45	41	5.57	1.24	38	0.04
24 Provide advice to an employer on appropriate work posture.	5.30	1.31	35	4.88	1.46	43	5.63	1.20	36	0.00
25 Provide advice to an employer about appropriate use of tools.	4.76	1.29	44	4.62	1.57	45	5.29	1.32	44	0.02
Work accommodation										
26 Provide advice to an employer on the consolidation of the systems and the procedure of fitness for duty assessment and work accommodation.	5.70	1.24	18	5.21	1.29	37	6.02	0.91	21	0.00
27 Implement face-to-face interview with employees, and submit opinions on fitness for duty and work accommodation for during pregnancy.	5.58	1.08	21	5.25	1.36	33	6.06	1.01	20	0.00
28 Implement face-to-face interview with employees, and submit opinions on fitness for duty and work accommodation for elder employees.	5.49	1.02	26	5.21	1.40	38	6.08	1.09	19	0.00
29 Implement face-to-face interview with employees, and submit opinions on fitness for duty and work accommodation for handicapped employees.	5.36	1.17	30	5.25	1.36	35	6.12	0.91	17	0.00
30 Implement face-to-face interview with employees, and submit opinions on fitness for duty and work accommodation for overseas employees.	5.54	1.13	23	4.92	1.54	42	6.00	1.18	23	0.00
Health education										
31 Provide advice to an employer on planning and implementation of health education for employees.	5.37	1.31	31	5.48	1.14	24	5.57	1.06	37	0.59
32 Perform health education for employees.	5.38	1.16	29	5.41	1.16	27	5.51	1.17	39	0.80
Health promotion										
33 Participate in measures about health promotion program for employees.	4.99	1.39	40	5.49	1.21	23	5.35	1.16	42	0.01
Occupational health training										
34 Provide advice to an employer on planning and implementation of occupational health training	5.37	1.32	32	5.38	1.20	28	5.67	1.14	34	0.30
35 Perform occupational health training.	5.02	1.38	41	5.30	1.25	32	5.37	1.18	41	0.17
36 Evaluate the implemented occupational health training.	4.71	1.26	45	5.23	1.28	36	5.24	1.23	45	0.00
Investigation of the causes of health adverse effect and measures for preventing a recurrence										
37 Provide advice to an employer on investigation of the causes of health adverse effect.	5.89	1.05	16	5.53	1.16	20	6.20	1.04	15	0.00
38 Provide advice to an employer on measures for preventing a recurrence of health adverse effect.	5.92	1.06	14	5.59	1.20	15	6.40	0.88	8	0.00
Field patrol										
39 Provide advice to an employer on planning of field patrol.	5.53	1.20	24	5.25	1.33	34	6.12	1.03	18	0.00

(continued)

Table 2. Necessity of practical abilities for non-specialist occupational physicians (continued)

	Occupational physician group		Health officer group		Occupational health nurse group		<i>p-value</i> **			
	mean scores	SD	rank	mean scores	SD	rank				
40 Properly implement field patrols, and identify and evaluate existing health hazards at the workplace.	6.11	0.95	10	5.33	1.39	29	6.39	0.98	11	0.00
41 Prepare the reports on field patrols, advise employer on necessary measures for improvement. Health committee	5.90	1.05	15	5.32	1.33	30	6.22	1.06	16	0.00
42 Provide advice to an employer to run the health committee efficiently.	5.27	1.31	36	5.55	1.26	16	5.69	1.35	33	0.12
43 Make appropriate remarks in the health committee. Employees' privacy	6.14	0.89	9	5.73	1.22	11	6.33	0.82	12	0.00
44 Respect employees' privacy. Maintenance of records	6.78	0.49	2	5.97	1.28	1	6.55	0.90	7	0.00
45 Properly maintain records including general health examination and interview.	6.04	1.18	12	5.90	1.24	4	5.73	1.28	32	0.33

** one way ANOVA test

icians. The majority of the abilities in the list are for direct services to employees, such as face-to-face interviews and assessment of their health conditions. The list included fewer practical abilities related to management or planning of occupational health programs compared to the list of specialist occupational physician abilities developed by the Japan Society for Occupational Health.

In the present study, we surveyed occupational health team members, including occupational health nurses, health officers, and specialist occupational physicians. Since the aim of the study was to identify the required abilities of nonspecialist occupational physicians, it was deemed appropriate to ask the co-workers only because of their understanding of their own expertise and their strength. However, as we did not assess the overall needs of occupational health services, the viewpoints of customers should be respected when designing the training programs.

As a result of the surveys, we found that the mean scores for all 45 practical abilities were greater than 4, i.e., in the middle of the 7-point Likert scale, in all the three groups. This suggests that all 45 practical abilities are essential abilities for nonspecialist occupational physicians.

Due to the different methods, it was difficult to compare the results of the three surveys accurately. Among the three groups, the scores reported by occupational health nurses were the highest in 41 of the 45 items. This suggests that occupational health nurses expect many activities of occupational physicians. By contrast, the scores reported by health officers were the lowest in 29 of the 45 items. This suggested that the health officers do not have as high expectations from occupational physicians as do nurses.

The correlation coefficient of the rankings among the occupational physician group and the other groups were more than medium. This validated the responses of the occupational physicians.

In particular, we found no large difference in the rankings of necessary practical abilities between occupational physicians and occupational health nurses. There was a slight difference: the occupational health nurse group rated the practical abilities of properly recording general health examinations, planning health surveillance, and performing health education lower than the occupational physician group. Occupational health nurses might consider these practical abilities as their own tasks rather than that of the occupational physicians.

Alternatively, we found several differences between occupational physicians and health officers. The practical abilities ranked as a high priority by the occupational physician group were not ranked as a high priority by the health officer group. A field patrol, which is a legal requirement and an activity in which occupational physicians spend a lot of time¹⁷⁾, was perceived by occupational

Table 3. comparison among three respondents

	Occupational physician group	Health officer group	Occupational health nurse group
3	A	A	A
44	A	A	A
16	A	B	A
12	A	A	A
15	A	A	A
7	A	B	A
11	A	A	A
43	A	A	B
8	A	B	A
40	A	C	A
4	A	A	B
45	B	A	C
9	B	A	A
38	B	B	A
41	B	C	B
37	B	B	B
26	B	D	B
5	B	C	C
1	B	A	C
21	B	D	C
14	B	B	B
27	B	C	B
30	B	D	B
10	C	A	C
39	C	C	B

(continued)

Table 3. comparison among three respondents (continued)

	Occupational physician group	Health officer group	Occupational health nurse group
28 Implement face-to-face interview with employees, and submit opinions on fitness for duty and work accommodation for elder employees.	C	D	B
13 Provide advice to an employer on planning an appropriate mental health program	C	B	B
17 Perform mental health training for managers.	C	B	C
32 Perform health education for employees.	C	C	D
31 Provide advice to an employer on planning and implementation of health education for employees.	C	C	D
34 Provide advice to an employer on planning and implementation of occupational health training	C	C	C
29 Implement face-to-face interview with employees, and submit opinions on fitness for duty and work accommodation for handicapped employees.	C	C	B
22 Provide advice to an employer on the usage and maintenance of the personnel equipment.	C	D	D
23 Provide advice to an employer on management of working time.	C	D	D
24 Provide advice to an employer on appropriate work posture.	C	D	D
42 Provide advice to an employer to run the health committee efficiently.	D	B	C
6 Interview and examine subjects undergoing health surveillance.	D	C	C
18 Perform mental health training for employee.	D	C	D
35 Perform occupational health training.	D	C	D
2 Interview and examine subjects undergoing periodic general health examination.	D	B	C
33 Participate in measures about health promotion program for employees.	D	B	D
20 Provide advice to an employer on planning and implementation of working environmental measurements.	D	D	D
19 Provide advice to an employer regarding questionnaire surveys on mental health such as the stress survey, with reference to planning, implementation, analysis of the results, and plans for improvement.	D	B	C
25 Provide advice to an employer about appropriate use of tools.	D	D	D
36 Evaluate the implemented occupational health training.	D	D	D

- A the top quartile of each respondent group
- B the second quartile of each respondent group
- C the third quartile of each respondent group
- D the bottom quartile of each respondent group

 Appendix. List A (15 items) minimum practical abilities required of non-specialist occupational physicians

- 3 Submit opinion on fitness for duty and work accommodation based on data from health examination.
 - 44 Respect employees' privacy.
 - 16 Submit opinion regarding the necessary work accommodation for employees suffering from mental illness based on interview results and information obtained from the attending doctor.
 - 12 Submit opinion on fitness for duty and work accommodation based on data from face-to-face interviews with employees.
 - 15 Implement interviews to employees regarding poor mental health, and assess their mental health status.
 - 7 Submit opinion on fitness for duty and work accommodation based on data from health surveillance.
 - 11 Implement face-to-face interviews for employees who have worked overtime, evaluate the subjects' conditions including mental and physical health status, degree of accumulated fatigue, and depression.
 - 43 Overview the data from health surveillance, and advise an employer necessary measures for improvement.
 - 8 Make appropriate remarks in the health committee.
 - 40 Properly implement field patrols, and identify and evaluate existing health hazards at the workplace.
 - 4 Conduct health guidance for employees based on health examination.
 - 45 Properly maintain records including general health examination and interview.
 - 9 Provide advice an employer on necessary measures to prevent adverse health effects due to overwork.
 - 1 Provide advice to an employer on planning periodic general health examination.
 - 10 Recommend to undergo face-to-face interviews for employees who have worked overtime.
-

 Appendix List B (24 items)-minimum practical abilities required of non-specialist occupational physicians

- 3 Submit opinions on fitness for duty and work accommodation based on data from health examination.
 - 44 Respect employees' privacy.
 - 16 Submit opinions regarding the necessary work accommodation for employees suffering from mental illness based on interview results and information obtained from the attending doctor.
 - 12 Submit opinion on fitness for duty and work accommodation based on data from face-to-face interviews with employees.
 - 15 Implement interviews to employees regarding poor mental health, and assess their mental health status.
 - 7 Submit opinions on fitness for duty and work accommodation based on data from health surveillance.
 - 11 Implement face-to-face interviews for employees who have worked overtime, evaluate the subjects' conditions including mental and physical health status, degree of accumulated fatigue, and depression.
 - 43 Overview the data from health surveillance, and advise an employer necessary measures for improvement.
 - 8 Make appropriate remarks in the health committee.
 - 40 Properly implement field patrols, and identify and evaluate existing health hazards at the workplace.
 - 4 Conduct health guidance for employees based on health examination.
 - 45 Properly maintain records including general health examination and interview.
 - 9 Provide advice an employer on necessary measures to prevent adverse health effects due to overwork.
 - 38 Provide advice to an employer on measures for preventing a recurrence of health adverse effect.
 - 41 Prepare the reports on field patrols, advise employer on necessary measures for improvement.
 - 37 Provide advice to an employer on investigation of the causes of health adverse effect.
 - 26 Provide advice to an employer on the consolidation of the systems and the procedure of fitness for duty assessment and work accommodation.
 - 5 Provide advice to an employer on planning health surveillance.
 - 1 Provide advice to an employer on planning periodic general health examination.
 - 21 Evaluate the results of the working environmental measurements, provide advice to an employer on necessary measures.
 - 14 Provide advice to an employer on the consolidation of systems and the development of processes and procedures to support return to work.
 - 27 Implement face-to-face interview with employees, and submit opinions on fitness for duty and work accommodation for during pregnancy.
 - 30 Implement face-to-face interview with employees, and submit opinions on fitness for duty and work accommodation for overseas employees.
 - 10 Recommend to undergo face-to-face interviews for employees who have worked overtime.
-

physicians as an essential activity in understanding the occupational health needs of the workplace and evaluating occupational health activities¹⁸). Alternatively, health officers tended to rate practical abilities related to the planning of specific occupational health activities higher than the occupational physicians. This suggests that the health officer group expects occupational physicians to contribute to the planning of specific occupational health activities and to support the health officers' operations. Occupational physicians rated the practical ability regarding health promotion lower than the health officers. The result was consistent with a past study¹⁹). Health promotion is recognized by WHO as increasingly important within the discipline²⁰). The occupational physician group might maintain a traditional view of the practical abilities required by nonspecialist occupational physicians.

In some countries, there are post-graduate short courses for physicians who are working part-time as occupational physicians. In Austria, occupational physicians are obliged to have 12 weeks of training and pass an examination⁵). In England, the diploma in occupational medicine is designed so the physicians need to complete a short training course and pass an examination²¹). The short training courses were provided by some colleges. One course combined online education and face-to-face sessions (two days)²²), and another course consisted of a 10-day program²³).

Tasks required for occupational physician by law vary among countries, and nonspecialist occupational physicians usually provide BOHSs on the basis of laws. Therefore, there are certain limitations in applying this result to other countries. However, this survey method and result may be useful when redesigning a curriculum for nonspecialist occupational physicians.

In Japan, the minimum legal requirement of occupational physicians is the completion of a 50-h training to obtain a diploma, and a 20-h training to renew the diploma. In comparison with other countries, it is relatively easy to get a diploma of occupational physician in Japan, as the number of training hours required is fewer and there is no need to pass an examination. This is far from adequate for nonspecialist occupational physicians to acquire the 45 practical abilities identified here. They need to be trained for more number of hours. However, as most nonspecialist occupational physicians work in clinical practices focused on other specialties, it is necessary to prioritize the practical abilities. We suggest two priority lists of practical abilities on the basis of the survey results of occupational physicians, and taking the responses of other disciplines into account (List A and List B). List A has 15 practical abilities that were ranked in the upper quartile on at least one survey. List B has 24 practical abilities that were either ranked in the upper half on the survey of occupational physicians or ranked in the top quartile on the survey of occupational health nurses or

health officers. Current training curricula should be reviewed to determine if they meet the expectations of stakeholders. Under the current system, it would only be able to acquire the 15 practical abilities of List A. If training hours for occupational physician increase, List B will be useful in redesigning the training curricula for nonspecialist occupational physicians in Japan.

Strengths and Limitations

To our knowledge, this is the first study to consider the practical abilities required by nonspecialist occupational physicians.

There were several limitations in this study. First, the potential for bias was present because of the representativeness of the sample, specifically the sample of occupational health nurses and health officers. We recruited registered nurses living on Kyushu Island. Our choice of Kyushu Island for the reason of maintaining a moderate sample number may not have provided a sample that fully represents the entirety of Japan. In addition, we conducted the survey of health officers using a private marketing research company because an appropriate list of health officers was not available. Although we set two criteria to achieve representativeness, this survey was a self-reported survey, and the possibility of false reports cannot be denied. Additionally, the respondents might not be fully representative of all health officers.

We recruited occupational physicians certified by the Japan Society for Occupational Health as the sample of occupational physicians. Since they know their job well and take a leading role in the field of occupational health in Japan, they were an appropriate sample to recruit.

Second, the response rates of the occupational physicians and occupational health nurses were not high, especially for occupational health nurses. The questionnaires were seven pages long and the volume of questions might have contributed to the reduced response rates. However, the response rates were equivalent with, or higher than, previous surveys on similar subjects^{17,24}).

Third, there were significant differences in the average scores of all items between the three respondent groups, but we could not compare the mean score of each practical ability between the groups using statistical tools. However, we compared the rankings of each respondent group and identified the differences between the occupational physician group and the other groups.

This study resulted in a rank-ordered list of 45 practical abilities that are required by nonspecialist occupational physicians. This result may be useful to review and redesign an existing training program for nonspecialist occupational physicians.

Acknowledgments: We thank the occupational physicians certified by the Japan Society for Occupational Health and occupational health nurses registered by the

Japan Society for Occupational Health Bureau of Occupational Health. This study was supported by the Occupational Health Promotion Foundation.

Conflict of Interest: The authors declare that there are no conflicts.

References

- 1) Rantanen J. Basic Occupational Health Services: Finnish institute of Occupational Health. [Online]. 2007[cited 2015 Nov. 25]; Available from: URL: http://www.ttl.fi/en/publications/Electronic_publications/Documents/BOHS3Edition28Sept2007_3_.pdf
- 2) Cashman C, Slovak A. The Occupational Medicine agenda: routes and standards of specialization in Occupational Medicine in Europe. *Occup Med* 2005; 55: 308-311.
- 3) Bulterys S. occupational medicine in Belgium: The European Union of Medical Specialists Section of occupational medicine. [Online]. 2014[cited 2015 Nov. 25]; Available from: URL: <http://www.uems-occupationalmedicine.org/node/78>
- 4) Matsuda S. The occupational physician in France. *J UOEH* 2013; 35(Suppl): 67-72 (in Japanese).
- 5) Westerholm P, Walters D. Supporting health at work: international perspectives on occupational health services. Wigston: Institution of Occupational Safety and Health; 2007. p. 5-10.
- 6) Ministry of Health Law. Industrial Safety and Health Act. [Online]. [cited 2015 Nov. 25]; Available from: URL: <http://www.japaneselawtranslation.go.jp/law/detail/?ft=5&re=01&dn=1&gn=3&sy=47&ht=A&no=57&x=65&y=14&ia=03&ky=&page=1>
- 7) Japan Medical Association. Guide for certification of occupational physicians. [Online]. 2011[cited 2015 Nov. 25]; Available from: URL: http://jmaqc.jp/sang/dl_files/sangyo_tebiki_H2304.pdf (in Japanese)
- 8) Japan Society for Occupational Health. Rule of occupational health physician certified. [Online]. [cited 2015 Nov. 25]; Available from: URL: http://ohc.med.uoeh-u.ac.jp/ENV/new/new_a1.html (in Japanese)
- 9) Mori K. Current status and issues in development of occupational physicians in Japan. *J UOEH* 2013; 35(Suppl): 35-40 (in Japanese).
- 10) Isse T, Nakamura H, Hachisuka K. Turnover of full-time occupational physicians in Japan in the period 2002-2008: a component model survey. *Sangyo eiseigaku zasshi* 2012; 54: 174-183 (in Japanese).
- 11) Moriguchi J, Sakuragi S, Takeda K, et al. Activities of private clinic- or hospital-based occupational physicians in Japan. *Ind Health* 2013; 51: 326-335.
- 12) Koda S, Yasuda N, Toyota M, Ohara H. A questionnaire study on improving occupational safety and health services provided by part-time industrial physicians. *Sangyo eiseigaku zasshi* 1998; 40: 91-100 (in Japanese).
- 13) Macdonald EB, Sanati KA. Occupational health services now and in the future: the need for a paradigm shift. *J Occup Environ Med* 2010; 52: 1273-1277.
- 14) Frumkin H. Don't lament, reinvent! the future of occupational medicine. *Am J Ind Med* 2002; 42: 526-528.
- 15) Franco G. The role of the occupational physician in the enlarged european union: challenges and opportunities. *Occup Med* 2006; 56: 152-154.
- 16) Ministry of Health Labour and Welfare. Overview of "integrated measure for the health problems prevention caused by overwork.". [Online]. [cited 2015 Nov. 25]; Available from: URL: http://www.mhlw.go.jp/english/wp/wp-hw4/dl/working_conditions_labour_relations/2011071911.pdf
- 17) Moriguchi J, Sakuragi S, Takeda K, et al. Activities of occupational physicians for occupational health services in small-scale enterprises in Japan and in the Netherlands. *Int Arch Occup Environ Health* 2010; 83: 389-398.
- 18) Isamu K. Strategy for improving quality of occupational health. Tsutahiro H, editor. Yokohama (Japan): Bio communications; 2013. p.220-225 (in Japanese).
- 19) Reetoo KN, Harrington JM, Macdonald EB. Required competencies of occupational physicians: a Delphi survey of UK customers. *Occup Environ Med* 2005; 62: 406-413.
- 20) Organization WH. Declaration on Workers Health 2006. [Online]. [cited 2015 Nov. 25]; Available from: URL: http://www.who.int/occupational_health/Declawh.pdf
- 21) Diploma in Occupational Medicine Examination Regulations, Syllabus and Guidance Notes for Candidates & Teaching Centres: Faculty of Occupational Medicine of the Royal College of Physicians. [Online]. [cited 2015 Nov. 25]; Available from: URL: <http://www.fom.ac.uk/wp-content/uploads/DOccMedregs2014.pdf>
- 22) CPD Diploma in Occupational Medicine: The University of Manchester. [Online]. [cited 2015 Nov. 25]; Available from: URL: http://www.population-health.manchester.ac.uk/epidemiology/COEH/postgraduate/CPD_Diploma_Guide_for_Applicants.pdf
- 23) Diploma in Occupational Medicine: University of Birmingham. [Online]. [cited 2015 Nov. 25]; Available from: URL: <http://www.birmingham.ac.uk/postgraduate/courses/cpd/med/occupational-medicine.aspx#CourseDetailsTab>
- 24) Terada H, Sone T, Takemura S. Study on actual situation of community industrial physicians for small and medium-sized enterprises and their involvement in community occupational health services. *Sangyo eiseigaku zasshi* 2005; 47: 259-268 (in Japanese).