

Factors associated with adherence to recommendations to visit a physician after annual health checkups among Japanese employees: a cross-sectional observational study

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Abstract: Periodic health checkups constitute an important public health strategy to prevent the onset of diseases and promote healthy behaviors. However, adherence to recommendations to undergo further medical examination after annual health checkups is not necessarily high. This study examined the factors related to adherence to recommendations among Japanese employees. We conducted a cross-sectional study of 219 employees who had ignored recommendations to visit a physician for the previous 3 yr; we assessed their work- and life-related factors, health status, and health literacy. We analyzed the data of 103 employees who met the inclusion criteria. Participants who lived alone and had a primary doctor, lower job demand, and lower self-rated health were significantly more likely to adhere to recommendations, suggesting that work- and life-related factors—rather than individual health literacy—may be more important. Further study is needed toward effective utilization of annual health checkups in the workplace.

Key words: Employees, Health checkups, Health literacy, Japanese, Workplace

Periodic health checkups are related to better health outcomes, such as lower mortality rates¹. Periodic health checkups constitute an important public health strategy to prevent the onset of diseases and promote healthy behaviors. In Japan, most employees undergo an annual health checkup at their workplace. Industrial physicians or nurses generally offer health-related advice to employees based on the results of their checkup. Individuals who require further examination or medical treatment are recommended to visit a physician. However, it is widely acknowledged that employees do not necessarily follow such recommendations.

According to the National Federation of Health Insurance Societies, among 4,156,041 workers who underwent a medical check conducted by the societies in 2012, 1,549,141 (37.3%) required further examination but did not visit a physician². Low adherence to recommendations to undergo further examination may undermine the purpose of health checkups—especially if such recommendations are ignored for a number of years.

Previous investigations have suggested that work-related factors, such as employment status (i.e., dispatched or hourly workers versus permanent workers), and physical factors, such as body mass index, were associated with adherence to recommendations to visit a physician^{3,4}. Health literacy has also been proposed as an important factor with regard to medical adherence (e.g., for cancer and diabetes screening) and health-related behaviors^{5–7}. How-

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ever, no study has assessed the factors related to adherence to recommendations to visit a physician after annual health checkups among employees who had ignored such recommendations for a number of years. Thus, it remains uncertain what factors affect employees' decisions to follow these recommendations after annual health checkups. The present study examined the factors related to adherence to recommendations to visit physicians after annual health checkups among Japanese employees who had ignored such recommendations for several years.

A self-administered questionnaire to assess work- and life-related factors and health literacy was conducted online from August 18 to September 11, 2015. We received informed consent from participants in the online system, and only those who provided consent were able to proceed to the next screen to answer questions. We obtained health insurance claims data to determine whether participants had visited a physician as well as health checkup data to assess their health-related behaviors. This study was approved by the ethical review committee of the Graduate School of Medicine, The University of Tokyo (examination number 10795).

The study participants were office workers at a Japanese travel-related health insurance society. Among the society's 10,000 employees, we targeted those who for 3 yr between 2011 and 2013 ($N=219$) had ignored recommendations following the annual health checkup to undergo further examination for hyperglycemia, high blood pressure, dyslipidemia, and hepatic dysfunction. We excluded subjects who had retired at the time of the questionnaire survey ($n=19$). The health insurance society sent e-mails to 200 potential participants, requesting that they respond to the online questionnaire. Among those, 119 employees completed the questionnaire (response rate, 59.5%). We excluded female employees ($n=16$) because the sample was insufficient to allow stratified analyses by sex. Consequently, 103 male workers were analyzed in this study.

To determine whether participants actually visited a physician after the annual health checkup, we obtained health insurance claims data in 2014 for 1 yr. Based on the disease classification for social insurance (119 classification codes) of the International Statistical Classification of Diseases in Japan, participants who had any of the following codes were defined as having visited a physician: 0402 (diabetes); 0403 (other internal secretion, nourishment, and metabolism disease); 0901 (hypertensive disease); 0903 (other cardiovascular disease); 0904 (subarachnoid hemorrhage); 0905 (bleeding in the brain); 0906 (brain infarct); 0907 (brain arteriosclerosis); 0908 (other cerebrovascular

disease); 0909 (arteriosclerosis); 0912 (other arteriosclerosis); 1106 (alcoholic hepatic disease); 1107 (chronic hepatitis); 1108 (cirrhosis); and 1109 (other hepatic disease).

We assessed job demand, job control, flexibility in taking days off, occupation, and monthly pay as work environment confounders. We evaluated job demand and control using the Brief Job Stress Questionnaire⁸). We assessed flexibility in taking days off on a five-point scale, ranging from 5 (having flexibility) to 1 (having no flexibility). Occupation was also assessed through the self-administered questionnaire. We derived salary details from a standard monthly remuneration list provided by the health insurance company. We obtained details of material status, having a child, and cohabitation status through the self-administered questionnaire. We derived information about whether the participant had a primary doctor from the annual health checkup data. We assessed the history of present illness from the annual health checkup data. Self-rated health status was determined in the self-administered questionnaire with a scale ranging from 1 (poor) to 5 (good)⁹). We measured health literacy using the Communicative and Critical Health Literacy scale⁷). The scale comprises three items for communicative health literacy (items 1–3) and two for critical health literacy (items 4–5). The scores of the five items were summed and divided by the number of items in the scale to yield a scale score (theoretical range, 1–5). The internal consistency of the scale was adequate (Cronbach's $\alpha=0.86$).

We first conducted bivariate analyses (independent t and χ^2 tests) to determine the bivariate associations between independent variables and visiting a physician after the annual health checkup. We then used logistic regression analysis to examine the relationship between visiting a physician after the annual health checkup and environment- and health-related factors. We entered all factors shown significant association in bivariate analysis and age in the multivariate logistic regression model. Because job control was assessed by the same questionnaire with job demand⁸), we also entered job control in this model. Our model had an acceptable fit (Hosmer-Lemeshow test, $p=0.844$). We analyzed the data using SPSS, version 21.0 (SPSS Inc., Chicago, IL, USA).

Table 1 presents the participant characteristics and descriptive results of the study variables. The mean age of the participants was 45.2 yr; 65% of the participants had high job demand, and 35% had low job control. The mean health literacy score was 3.51 (standard deviation [SD]=0.80). In all, 57 (55.3%) participants visited a physician after the annual health checkup. Participants who

Table 1. Association between study variables and visiting a physician

Variable	Range or category	Total (N=103)	Visiting a physician (n=57)	Not visiting a physician (n=46)	<i>p</i>
		N(%) or mean ± SD			
Age (yr)	<45	58 (56.3)	31 (54.4)	27 (58.7)	0.661 ^a
	≥45	45 (43.7)	26 (45.6)	19 (41.3)	
Work-related factors					
Job demand	High	67 (65.0)	32 (56.1)	35 (76.1)	0.035 ^a
	Low	36 (35.0)	25 (43.9)	11 (23.9)	
Job control	High	67 (65.0)	38 (66.7)	29 (63.0)	0.701 ^a
	Low	36 (35.0)	19 (33.3)	17 (37.0)	
Flexibility in taking days off	1–5	2.66 ± 1.16	2.59 ± 1.11	2.74 ± 1.22	0.518 ^b
Occupation	Manager	37 (35.9)	18 (31.6)	19 (41.3)	0.306 ^a
	Sales or clerical position	66 (64.1)	39 (68.4)	27 (58.7)	
Monthly pay (yen)	<440,000	60 (58.3)	32 (56.1)	28 (60.9)	0.690 ^a
	≥440,000	43 (41.7)	25 (43.9)	18 (39.1)	
Life-related factors					
Marital status	Married	80 (77.7)	42 (73.7)	38 (82.6)	0.280 ^a
	Other	23 (22.3)	15 (26.3)	8 (17.4)	
Having a child	Yes	73 (70.9)	39 (68.4)	34 (73.9)	0.542 ^a
	No	30 (29.1)	18 (31.6)	12 (26.1)	
Cohabitation status	Living with others	79 (76.7)	39 (68.4)	40 (87.0)	0.027 ^a
	Living alone	24 (23.3)	18 (31.6)	6 (13.0)	
Having a primary doctor	Yes	33 (34.4)	24 (44.4)	9 (21.4)	0.019 ^a
	No	63 (65.6)	30 (55.6)	33 (78.6)	
Health status					
History of present illness	Yes	20 (19.4)	16 (28.1)	4 (8.7)	0.013 ^a
	No	83 (80.6)	41 (71.9)	42 (91.3)	
Self-rated health status	1–5	3.02 ± 0.90	2.79 ± 0.94	3.30 ± 0.89	0.006 ^b
Health literacy	1–5	3.51 ± 0.80	3.47 ± 0.87	3.54 ± 0.72	0.663 ^b

Missing values were deleted listwise.

^a χ^2 test

^b *t* test

lived alone and had lower job demand, a history of illness, a primary doctor, or a lower self-rated health status were significantly more likely to visit a physician.

Table 2 shows the logistic regression analyses of visiting a physician after the annual health checkup, work- and life-related factors, and health status. After adjustment for age, having a primary doctor, job demand, cohabitation status, and self-rated health status showed a statistically significant relationship with visiting a physician: respectively, adjusted odds ratio (OR)=4.191, 95% confidence interval (CI), 1.454–12.077; adjusted OR=3.353, 95% CI, 1.167–9.634; adjusted OR=0.186, 95% CI, 0.053–0.651; and adjusted OR=0.486, 95% CI, 0.272–0.869.

This study explored the factors related to adherence to recommendations for visiting a physician after annual health checkups among Japanese employees who had ignored such recommendations for 3 yr. Through logistic regression analyses, we determined the relation-

Table 2. Relationship between visiting a physician after an annual health checkup with environment- and health-related factors

Variable	OR ^a	95% CI ^b	<i>p</i>
Having a primary doctor (yes)	4.191	1.454–12.077	0.008
Job demand (low)	3.353	1.167–9.634	0.025
Job control (high)	1.874	0.648–5.419	0.246
Cohabitation status (living with others)	0.186	0.053–0.651	0.009
Self-rated health status (higher score)	0.486	0.272–0.869	0.015
Health literacy (higher score)	0.905	0.486–1.683	0.752

^a Odds ratios (visiting a physician group compared with not visiting a physician group) were calculated by multivariate logistic regression analysis adjusted for age.

^b Confidence interval

ship between visiting a physician after the annual health checkup and work- and life-related factors and health status.

Among our participants, visiting a physician after the annual health checkup was associated with having a pri-

mary doctor. One investigation has suggested that middle-aged individuals with a primary doctor were more likely to visit a physician⁴. In the present study, 80% of the participants were aged over 40 yr. The differences in the frequency of visiting a physician identified in the present investigation are consistent with the findings of that report.

In the present study, visiting a physician after the annual health checkup had a significant association with lower job demand. Previous investigations have found higher job demand to be related to lower health outcomes¹⁰. It has also been suggested that employees with a low level of psychological job control are less likely to visit a physician than those with a high level of job control¹¹. However, in the present study, job control did not have a significant association with visiting a physician. In this investigation, 65% of participants had high job control, and 35% had low job demand. Thus, the level of job demand may have been a more important factor for our participants than in those earlier studies. Our study participants were employees who had ignored recommendations to undergo further examination after annual health checkups for 3 yr; accordingly, having higher job control alone may not have been sufficient to motivate them to make time to visit a physician.

We found that participants who lived with someone were less likely to visit a physician. One report determined that people who lived with another individual were more likely to undergo health checkups¹². In the present study, subjects who lived with someone were more likely to be middle-aged, have children, and be married. Thus, they may have had more family commitments and less time for themselves than participants who lived alone. In the self-administered questionnaire in the present investigation, 21 subjects (36.8%) cited lack of time as the reason for not having visited a physician. Shortage of time may be an especially critical factor for people with family commitments.

In the present study, participants with poor self-rated health status were more likely to visit a physician after annual health checkups. Previous investigations based on the health belief model have suggested that perceived susceptibility (subjective perception of the risk of developing a condition) led to greater utilization of health services¹³. Our self-administered questionnaire included one question about the reason for not visiting a physician. Among the 57 participants who failed to visit a physician, 13 (22.8%) stated that they thought their condition was not serious. Participants with poor self-rated health status may have believed their condition—as reflected in the results of the annual health checkup—to be more serious and felt vul-

nerable; they were thus more likely to visit a physician than participants with better self-rated health status.

Contrary to our expectations, we did not find a significant association between health literacy and adherence to recommendations to visit a physician. Previous studies with diabetes patients reported that limited health literacy predicted lower medication adherence¹⁴. We focused on workers and preventive behavior; thus, work and life factors—rather than health literacy—may have been more significant factors in adhering to recommendations to visit a physician. In addition, contrary to previous reports measuring functional health literacy, we assessed interactive and critical health literacy. The mean score for health literacy was 3.51 (SD=0.80), which is lower than that found in one study of Japanese office workers (N=190; mean \pm SD, 3.72 \pm 0.68)⁷. The score we obtained is also lower than that disclosed in a nationwide online survey of the general Japanese population, which included elderly subjects (N=712; mean \pm SD, 3.59 \pm 0.62)¹⁵. Fewer participants in the present study may have had sufficient health literacy to undertake actions to protect their health; thus, we did not observe a significant association with visiting a physician.

Several limitations should be considered when interpreting the results of the present investigation. First, this was a cross-sectional observational study. Accordingly, we were unable to determine the causal relationship among the determinants of visiting a physician after annual health checkups. Second, the factors related to visiting a physician were assessed by self-reporting. Thus, our cross-sectional observational study design may have caused recall bias. Third, we collected the data from a single health insurance society and excluded female workers from the analyses. Fourth, because the participants in this study were people who had ignored recommendations to undergo further examination for 3 yr, we could not compare them with individuals who had actually visited a physician following such recommendations. Further study is needed to explore the factors related to adherence to recommendations to visit a physician after annual health checkups among all workers who were thus recommended. Fifth, our sample size was relatively small, and the response rate was quite low. It is possible that individuals who were interested in their health and had higher health literacy were more likely to have participated in the study. The associations of work and life factors as well as health literacy with visiting a physician may change if the response rate is high. To address this problem, further research with a larger sample is needed to confirm our findings.

Despite these limitations, this study identified the fac-

tors related to adherence to recommendations to visit a physician after annual health checkups among Japanese employees who had ignored recommendations for 3 yr. We found that work- and life-related factors (such as job demand, having a primary doctor, and cohabitation status) and self-rated health status were associated with adherence to recommendations to visit a physician. Thus, to increase adherence to such recommendations, it is necessary to consider work- and life-related factors rather than individual health literacy—especially among individuals who have ignored the recommendations for multiple years. Further study is needed for effective utilization of annual health checkups as an opportunity to provide health education and for interventions toward improving health in the workplace.

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Competing interests

The authors declare no competing interest.

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