Job Satisfaction, Common Cold, and Sickness Absence among White-collar Employees: A Cross-sectional Survey

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Abstract: The purpose of this study is to examine the independent association of job satisfaction with common cold and sickness absence among Japanese workers. A total of 307 apparently healthy white-collar employees (165 men and 142 women), aged 22–69 (mean 36) yr, completed a questionnaire survey during April to June, 2002. Global job satisfaction was measured by a 4-item scale from the Japanese version of a generic job stress questionnaire with higher scores indicating greater satisfaction. Information about whether the employees had a common cold (within the past 6 months) and sickness absence (within the past 12 months) was self-reported. Hierarchical log-linear Poisson regression analysis controlling for confounders revealed that greater job satisfaction was inversely correlated with days ($B=–0.116$; $p<0.001$) and times ($B=–0.058$; $p=0.067$) of common cold and days ($B=–0.160$; $p<0.001$) and times ($B=–0.141$; $p<0.001$) of sickness absence. Our findings suggested that poor job satisfaction is associated with both common cold and sickness absence.

Key words: Job satisfaction, Common cold, Sickness absence, White-collar employee, Generic job stress questionnaire, Japan

Job satisfaction, defined as the degree of pleasure a worker derives from his/her job that consists of both affective and cognitive components, is one of the most widely studied constructs in occupational health psychology[1]. It is often used as a summary measure of workers' well-being because it captures not only micro-level daily interactions on the job but also macro-level factors related to selection into a job. Job satisfaction is determined by a number of work environment conditions such as relationships with colleagues and managers, income level, chances of promotion and advancement, level of interest in the job, independence at work, job stability and security, and work stressors[1]. Therefore, job satisfaction has been recognized to represent the subjective evaluation of working conditions as a whole.

Given its popularity, there is a considerable amount of literatures that links job satisfaction with various health measures including mental and physical health status. A comprehensive meta-analysis based on 485 studies of job satisfaction and health reported that workers with low levels of satisfaction were more likely to experience anxiety, burnout, depression, cardiovascular disease, musculoskeletal disorders, and other physical illnesses, indicating that job dissatisfaction is an important predictor of physical and psychological health[2].

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Although a number of studies point to a relationship between job satisfaction and health indicators, little is known about the relationship between job satisfaction and the common cold[3]. The common cold is an important occupational health problem because it is the major cause of sickness absence in the workforce; the Whitehall II study indicated that respiratory disorders and gastroenteritis accounted for 50–60% of all spells of absence[4]. Results of the Maastricht cohort study suggested that workers who rated their level of satisfaction as 'not good/moderate' had a 36% increased risk of being absent from work due to the common cold compared to those reporting a 'good' level of satisfaction[3]. The finding indicates that reduced job satisfaction may promote acquisition of an infection or reactivation of a latent infection which can result in increased sickness absences.

A number of studies have found an inverse association between job satisfaction and sickness absences in Western countries[5–10], although the information regarding this relationship is sparse in Japan[11]. A previous study found that the average job satisfaction score was lower in male workers who reported 5+ days of sickness absence per year (n=132) compared to those reporting 0.5–4.5 d of sickness absence per year (n=269) or those with no sickness absences (n=335)[11]. However, in the same study, female workers reporting 5+ days of sickness absence per year (n=25) had a highest level of job satisfaction compared to those reporting 0.5–4.5 d per year (n=35) or no sickness absences (n=37). The finding in female workers needs to be interpreted cautiously because of a small sample size. The purpose of this study is to determine the association of job satisfaction with both common cold and sickness absence in the Japanese working population.

The study design was cross-sectional and data were collected by self-administered questionnaires at a pharmaceutical company and a trading company in Japan. The study was conducted as a part of the occupational health examinations during April to June 2002. All employees in both companies were full-time and white-collar daytime Japanese employees. A total of 643 employees were initially recruited for this study. Survey questionnaires, including purpose, instruction, and informed consent, were given to a total of 626 employees (17 employees could not be reached because they were out due to sickness (mostly because of psychiatric illnesses) or pregnancy). Four hundred and four employees agreed to participate in the questionnaire survey and replied with a signed consent form (response rate 64.5%). Of these 404 employees, 33 were excluded because of missing data for one of the study parameters. An additional 64 employees who reported

physical and psychological disorders at the time of survey were excluded (see 'covariates' section for detail), which resulted in a final sample size of 307 employees (165 men and 142 women). Table 1 displays the characteristics of the study participants. The study protocol was reviewed and approved by the Institutional Review Board of the National Institute of Occupational Safety

Table 1. Characteristics of study participants (n=307)

Variable	n (%)
Sex:	
Men	165 (53.7)
Women	142 (46.3)
Education (in years):	
< 16 yr	94 (30.6)
≥ 16 yr	213 (69.4)
Smoking:	
Lifetime nonsmoker	161 (52.4)
Former smoker	51 (16.6)
Current smoker	95 (30.9)
Difficulty initiating and maintainig sleep:	
No	245 (79.8)
Yes	62 (20.2)
Company type:	
Pharmaceutical	151 (49.2)
Trading	156 (50.8)
Occupational grade	
Managerial	45 (14.7)
Non-managerial	262 (85.3)
Common cold (within past 6 months):	
Total days with symptoms	
0 d	79 (25.7)
1–3 d	91 (29.6)
4–7 d	68 (22.1)
8+ d	69 (22.5)
Total times with symptoms	
0 (no) episodes	79 (25.7)
1 episode	102 (33.2)
2 episodes	70 (22.8)
3+ episodes	56 (18.2)
Sickness absence (within past 12 months):	
Total days of sickness absence	
0 days	154 (50.2)
1–3 d	108 (35.2)
4–7 d	35 (11.4)
8+ d	10 (3.3)
Total times of sickness absence	
0 (no) episodes	154 (50.2)
1 episode	75 (24.4)
2 episodes	34 (11.1)
3+ episodes	44 (14.3)
	Mean [SD, range]
Job satisfaction[a]	9.5 [1.5, 5–13]
Age (in years)	36.1 [10.5, 22–69]
Alcohol consumption (g ethanol/week)	99 [130, 0–805]
Leisure-time physical activity (METs/week)	5.5 [9.3, 0–53]
BMI (kg/height (m)^2)	21.8 [3.0, 15.4–32.8]

[a]Sum of JSQ1 to JSQ4 (see text for detail).
SD=standard deviation; METs=metabolic equivalents; BMI=body mass index.

and Health, Japan and by the Ethical Committee of the Kyushu University.

Job satisfaction was assessed by a 4-item scale included in the Japanese version of the generic job stress questionnaire[12] developed by the US National Institute for Occupational Safety and Health (NIOSH)[13]. Items for the scale are as follows:

1) Knowing what you know now, if you had to decide all over again whether to take the type of job you now have, what would you decide (**JSQ1**)? I would… 1) Decide definitely not to take this type of job, 2) Have some second thoughts, 3) Decide without hesitation to take the same job

2) If you were free right now to go into any type of job you wanted, what would your choice be (**JSQ2**)? I would… 1) Not want to work, 2) Take a different job, 3) Take the same job

3) If a friend of yours told you he/she was interested in working in a job like yours, what would you tell him/her (**JSQ3**)? I would… 1) Advise against it, 2) Have doubts about recommending it, 3) Strongly recommend it

4) All in all, how satisfied would you say you are with your job (**JSQ4**)? 1) Not at all satisfied, 2) Not too satisfied, 3) Somewhat satisfied, 4) Very satisfied

Each item response number corresponds to its item score. Job satisfaction was calculated by adding scores of JSQ1 to JSQ4 (positively-oriented). The Cronbach's alpha value for this scale was 0.68.

Data on common cold and sickness absence were collected with 2 open-ended questions as follows: a) How many times (episodes) were you infected with common cold in the past 6 months and how many days were symptoms present? and b) How many times (episodes) and how many days in total have you been absent from work due to sickness, including paid leave, in the past 12 months?[14] Please indicate the total number of times and days for common cold and sickness absence separately. We asked for self-reported sickness absence rather than reviewing official records because in Japan, employees prefer to use paid leave instead of sickness absence when they are sick[11]. Thus, the official record may only capture a portion of absence records.

Covariates considered included age (in years), sex (men or women), education, smoking, alcohol consumption, leisure-time physical activity, sleep (difficulty initiating and maintaining sleep (DIMS)), height, weight, self-reported illness, occupational grade (managerial or non-managerial), and company type (pharmaceutical or trading). Education was converted into 2 categories (less than 16 yr (high school, vocational, junior (2-yr) college

or less) 'coded 1' and 16 yr or more (college, university, graduate school) 'coded 2'). Smoking was categorized into current smoker, former smoker, and lifetime nonsmoker. Alcohol consumption was estimated by asking the usual amount of alcoholic drinks consumed per day and the number of occasions in a week that alcoholic drinks were consumed. We converted gross liquor consumption into net ethanol intake. We assessed leisure-time physical activity by calculating the energy expenditure of habitual physical exercise. We asked frequency, type, and length of physical exercise per month and converted these data to metabolic equivalents (METs). Estimated METs were assigned to the physical activities according to their mean intensity levels. One MET corresponds to an energy expenditure of approximately 1 kcal/kg/h. Weekly leisure-time physical activity was calculated from this questionnaire. DIMS was defined by having either difficulty initiating sleep (need 30+ minutes to fall asleep) or frequency of difficulty maintaining sleep (more than once a week)[15]. Information on height (m) and weight (kg) were obtained to assess body mass index (BMI), calculated as weight in kilograms divided by the square of height in meters. For self-reported illness, participants were asked if they had been diagnosed or treated for any of the following symptoms or disorders: hypertension, diabetes mellitus, menopausal disorder, depression, asthma, allergies, cancer, hyperlipidemia, cardiovascular disease, arrhythmia, angina pectoris, liver disease, cerebrovascular disease, hyperthyroidism, gastric/duodenal ulcer, or other diseases. If the subjects reported 'other diseases', they were asked to specify the condition. As a result, 67 participants with the following symptoms or disorders were identified; hypertension (n=18), diabetes mellitus (n=6), menopausal disorder (n=3), major depression (n=4), asthma (n=2), allergies (n=12), liver diseases (n=2), gastric/duodenal ulcer (n=4), autoimmune disorders (n=2), hyperlipidemia (n=10), psychosomatic disease (n=2), and the common cold (n=10). These participants (n=67) were excluded from the analyses in order to eliminate the potential effects of health status on sickness absence.

A log-linear Poisson regression model was used for the association of job satisfaction with common cold and sickness absence, because the numbers of these measures are a form of count data. To test the robustness of the association, a hierarchical model was applied. Among independent variables, sex, education, smoking status, DIMS, job title, and company type were treated as categorical variables while the remaining variables were treated as continuous variables. The significance level for all statistical analyses was $p<0.05$ (two-tailed test). We analyzed the data using the Statistical

Package for the Social Sciences version 15.0 (SPSS, Inc., Chicago, IL, USA).

Participants included in the final analyses were 165 men and 142 women, aged 22–69 (mean 36, SD 1.5) yr (Table 1). More than two-thirds of the participants had at least a 4-yr college education or higher. Overall, 151 employees were working at a pharmaceutical company and 156 were working at a trading company. About 15% were holding managerial positions at the workplace. Roughly, 31% were current smokers, 17% were former smokers, and 52% were lifetime nonsmokers. Twenty percent of participants reported DIMS. The average job satisfaction score was 9.5 (SD 1.5) ranging from 5 to 13 (possible range 4 to 13) in this sample. Over 74.3% of participants reported at least one episode of the common cold within the past 6 months. Similarly, 49.8% of participants reported at least one episode of sickness absence within the past 12 months. Participants consumed 99 g of pure ethanol from alcohol beverages per week and spent 5.5 METs per week in leisure-time physical activity. The average BMI for this sample was 21.8 (SD 3.0) ranging from 15.4 to 32.8.

The association of job satisfaction with common cold and sickness absence are shown in Table 2. Log-linear Poisson regression analysis controlling for all potential confounders revealed significant inverse associations between job satisfaction and number of days (B=–0.116; $p<0.001$) of the common cold and days (B=–0.160; $p<0.001$) and times (B=–0.141; $p<0.001$) of sickness absences. The relationship between job satisfaction and times of the common cold was marginally significant (B= –0.058; $p=0.067$). The results were similar even though the analyses were separately done by company types, i.e., trading or pharmaceutical. Furthermore, the common cold (days/times) and sickness absence (days/times) using Spearman rank correlation coefficients, were all positively correlated ($r_s \geq 0.331$) (data not shown).

This study revealed that job satisfaction is inversely associated with days and times of sickness absence, which is consistent with some previous studies[5–11]. The relationship between job satisfaction and days of having a common cold was significant but the association with number of times of the common cold was marginal. This finding is also consistent with one previous study showing that a reduced level of satisfaction is associated with a risk of being absent from work due to the common cold[3].

It is likely that the relationship between job satisfaction and sickness absence/common cold is reciprocal. Reduced job satisfaction may increase sickness absence/ common cold, while in turn sickness absence/common cold may affect job satisfaction levels as well. Three prospective studies have reported that job satisfaction level predicts subsequent absences[8–10], but the evidence showing the reverse is lacking. A prospective study design to clarify these associations is warranted.

Several limitations to our study should be noted. First, participants in this study were not a representative sample of the Japanese working population, which may limit the generalizability of the results. Second, the study was cross-sectional in nature; thus no causal interpretations can be made. Third, we only collected data on global job satisfaction but not facets of job satisfaction that capture specific dimensions of job satisfaction. Fourth, data on common cold and sickness absence were collected by self-report which can be a source of reporting bias. Fifth, reporting of the common cold may not exclusively include the common cold but more serious illness as well. Finally, although we adjusted for a variety of confounders, we could not exclude the possibility that unadjusted factors, i.e., personality traits, genetic components, and other occupational factors, or unknown third factor(s) may explain the present findings.

With these limitations in mind, this study suggested that job satisfaction is associated moderately with common cold and sickness absence among white-collar employees. Future studies should test whether increasing job satisfaction leads to reduced sickness absence/ common cold over time and vice versa.

Table 2. Hierarchical log-linear Poisson regression analysis for the association of job satisfaction with common cold and sickness abcences (m=307)

Common cold (total days within the past 6 months)

	Step 1					Step 2					Step 3				
	B	SE	95%CI	χ^2	p	B	SE	95%CI	χ^2	p	B	SE	95%CI	χ^2	p
Job satisfaction[a]	−0.161	0.0157	(−0.192, −0.131)	105.732	<0.001	−0.120	0.0158	(−0.151, −0.089)	57.823	<0.001	−0.116	0.0155	(−0.146, −0.085)	55.525	<0.001
Age (in years)						−0.036	0.0029	(−0.041, −0.030)	151.073	<0.001	−0.031	0.0037	(−0.039, 0.024)	73.266	<0.001
Women (reference = men)						0.031	0.0561	(−0.079, 0.141)	0.299	0.584	0.118	0.0723	(−0.024, 0.260)	2.652	0.103
Education ≥ 16 yr (reference < 16 yr)						−0.441	0.0575	(−0.554, −0.329)	58.873	<0.001	−0.244	0.0590	(−0.360, −0.128)	17.088	<0.001
Former smoker (reference = lifetime nonsmoker)											0.385	0.0677	(0.252, 0.518)	32.369	<0.001
Current smoker (reference = lifetime nonsmoker)											−0.061	0.0604	(−0.179, 0.057)	1.021	0.312
Alcohol consumption (g ethanol/week)											0.000	0.0003	(−0.001, 0.000)	0.883	0.347
Leisure-time physical activity (METs/week)											−0.009	0.0027	(−0.015, −0.004)	11.882	0.001
Difficulty initiating and maintaing sleep (reference = no)											0.567	0.0525	(0.464, 0.670)	116.503	<0.001
BMI (kg/height (m)²)											0.037	0.0090	(0.020, 0.055)	17.199	<0.001
Occupational grade, managerial (reference = non-managerial)											0.079	0.1021	(−0.121, 0.279)	0.604	0.437
Company type, trade industry (reference = pharmaceutical)											−0.374	0.0628	(−0.497, −0.251)	35.485	<0.001

Common cold (total times within the past 6 months)

	Step 1					Step 2					Step 3				
	B	SE	95%CI	χ^2	p	B	SE	95%CI	χ^2	p	B	SE	95%CI	χ^2	p
Job satisfaction[a]	−0.083	0.0310	(−0.128, −0.012)	7.229	<0.001	−0.056	0.0315	(−0.118, 0.006)	3.135	0.077	−0.058	0.0316	(−0.120, 0.004)	3.352	0.067
Age (in years)						−0.019	0.0053	(−0.030, −0.009)	13.201	<0.001	−0.010	0.0068	(−0.024, 0.003)	2.284	0.131
Women (reference = men)						0.169	0.1126	(−0.052, 0.389)	2.239	0.135	0.214	0.1473	(−0.075, 0.503)	2.110	0.146
Education ≥ 16 yr (reference < 16 yr)						−0.231	0.1162	(−0.459, −0.003)	3.960	0.047	−0.074	0.1214	(−0.312, 0.164)	0.372	0.542
Former smoker (reference = lifetime nonsmoker)											−0.310	0.1599	(−0.624, 0.003)	3.762	0.052
Current smoker (reference = lifetime nonsmoker)											−0.092	0.1160	(−0.319, 0.135)	0.628	0.428
Alcohol consumption (g ethanol/week)											0.001	0.0005	(0.000, 0.001)	1.445	0.229
Leisure-time physical activity (METs/week)											−0.011	0.0055	(−0.022, −0.000)	4.131	0.042
Difficulty initiating and maintaing sleep (reference = no)											0.050	0.0186	(0.014, 0.087)	7.340	0.007
BMI (kg/height (m)²)											0.440	0.1080	(0.228, 0.651)	16.564	<0.001
Occupational grade, managerial (reference = non-managerial)											−0.436	0.2114	(−0.851, −0.022)	4.259	0.039
Company type, trade industry (reference = pharmaceutical)											−0.234	0.1198	(−0.469, 0.000)	3.832	0.050

Sickness absence (total days within the past 12 months)

	Step 1					Step 2					Step 3				
	B	SE	95%CI	χ^2	p	B	SE	95%CI	χ^2	p	B	SE	95%CI	χ^2	p
Job satisfaction[a]	−0.222	0.0280	(−0.276, −0.167)	62.805	<0.001	−0.179	0.0285	(−0.235, −0.123)	39.512	<0.001	−0.160	0.0297	(−0.218, −0.101)	28.902	<0.001
Age (in years)						−0.003	0.0045	(−0.012, 0.006)	0.447	0.504	−0.006	0.0065	(−0.019, 0.007)	0.844	0.358
Women (reference = men)						0.548	0.1068	(0.339, 0.758)	26.390	<0.001	0.548	0.1376	(0.278, 0.818)	15.856	<0.001
Education ≥ 16 yr (reference < 16 yr)						−0.416	0.1014	(−0.615, −0.218)	16.857	<0.001	−0.250	0.1090	(−0.464, −0.037)	5.283	0.022
Former smoker (reference = lifetime nonsmoker)											−0.784	0.1912	(−1.16, −0.409)	16.809	<0.001
Current smoker (reference = lifetime nonsmoker)											0.261	0.0995	(0.066, 0.456)	6.871	0.009
Alcohol consumption (g ethanol/week)											−0.002	0.0006	(−0.004, −0.001)	18.751	<0.001
Leisure-time physical activity (METs/week)											−0.022	0.0058	(−0.033, −0.011)	14.761	<0.001
Difficulty initiating and maintaing sleep (reference = no)											0.695	0.0941	(0.510, 0.879)	54.564	<0.001
BMI (kg/height (m)²)											0.081	0.0163	(0.049, 0.113)	24.762	<0.001
Occupational grade, managerial (reference = non-managerial)											−0.275	0.1912	(−0.649, 0.100)	2.064	0.151
Company type, trade industry (reference = pharmaceutical)											−0.042	0.1129	(−0.263, 0.179)	0.139	0.710

Sickness absence (total etimes within the past 12 months)

	Step 1					Step 2					Step 3				
	B	SE	95%CI	χ^2	p	B	SE	95%CI	χ^2	p	B	SE	95%CI	χ^2	p
Job satisfaction[a]	−0.189	0.0348	(−0.257, −0.121)	29.607	<0.001	−0.147	0.0354	(−0.217, −0.078)	17.225	<0.001	−0.141	0.0358	(−0.211, −0.071)	15.555	<0.001
Age (in years)						−0.004	0.0057	(−0.015, 0.007)	0.464	0.496	0.005	0.0076	(−0.010, 0.020)	0.454	0.500
Women (reference = men)						0.663	0.1331	(0.402, 0.923)	24.803	<0.001	0.716	0.1674	(0.388, 1.04)	18.304	<0.001
Education ≥ 16 yr (reference < 16 yr)						−0.316	0.1256	(−0.562, −0.069)	6.310	0.012	−0.046	0.1296	(−0.300, 0.208)	0.124	0.724
Former smoker (reference = lifetime nonsmoker)											−0.615	0.2166	(−1.04, −0.191)	8.064	0.005
Current smoker (reference = lifetime nonsmoker)											0.204	0.1267	(−0.045, 0.452)	2.585	0.108
Alcohol consumption (g ethanol/week)											−0.003	0.0007	(−0.004, −0.001)	12.164	<0.001
Leisure-time physical activity (METs/week)											−0.013	0.0064	(−0.026, −0.001)	4.252	0.039
Difficulty initiating and maintaing sleep (reference = no)											0.466	0.1189	(0.233, 0.699)	15.368	<0.001
BMI (kg/height (m)²)											0.122	0.0190	(0.085, 0.160)	41.544	<0.001
Occupational grade, managerial (reference = non-managerial)											−0.626	0.2522	(−1.12, −0.132)	6.166	0.013
Company type, trade industry (reference = pharmaceutical)											−0.395	0.1395	(−0.668, −0.122)	8.022	0.005

[a]Positively oriented.

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