

Smoking status and the Kano Test for Social Nicotine Dependence (KTSND) in employees of a regional cancer center in Japan

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Objectives

We investigated the prevalence of smoking and attitudes concerning smoking among employees of a cancer hospital using the Kano Test for Social Nicotine Dependence (KTSND).

Methods

A self-administered questionnaire, including the KTSND as well as questions regarding smoking status, occupation and demographics were collected from 611 employees of a regional cancer center.

Results

The smoking rates were as follows: medical doctors, 5.4% (male 5.8%, female 0.0%); nurses, 17.4% (male 50.0%, female 15.5%); other medical workers, 3.9% (male 7.7%, female 0.0%); clerical or site maintenance workers 21.9% (male 39.7%, female 12.4%). The KTSND scores (mean \pm standard deviation) of 14.7 ± 4.4 for smokers were significantly higher than those of 12.2 ± 4.7 for past smokers, and 11.0 ± 5.9 for never-smokers. Although the KTSND scores were not different in each occupational category among never smokers, those for clerical or site workers (17.2 ± 5.4) were significantly higher than those for medical doctors (12.3 ± 6.2) or nurses (13.7 ± 5.0) among past or current smokers. Current smokers but also never and past smokers gave a strongly positive response to permission of smoking where ashtrays are available.

Conclusions

The prevalence of smoking in the staff in a regional cancer center was not lower than expected. A significant difference was observed in KTSND scores according to smoking status, and the KTSND scores differed according to occupational category in the hospital. It is suggested that it is necessary to remove ashtrays and abolish smoking areas to discourage smoking in hospitals.

Key words

Kano Test for Social Nicotine Dependence (KTSND), smoking, nicotine dependence, hospital workers

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受付日 2011年1月4日 採用日 2011年10月14日

INTRODUCTION

Smoking is the main risk factor for lung cancer, and it is known that continuation of tobacco use increases the risk of cancer and of other diseases. The Japanese Cancer Association¹⁾, the Japanese Respiratory Society²⁾, the Japanese Circulation Society³⁾, and the Japanese Nursing Association⁴⁾ have issued non-smoking policy statements, and request that their members promote various activities to increase the rate of cessation of smoking. It is desirable that anti-smoking measures be planned and introduced systematically rather than depending on the efforts of individuals.

The Japanese Association of Clinical Cancer Centers (JACC) was established in 1973 for the purpose of contributing to improvements in prevention, diagnosis, and the treatment of cancer⁵⁾. The secretariat of the JACC devised a tobacco control plan to consolidate their position as a role model for other hospitals in 2006⁶⁾. The plan established that each hospital should keep the smoking rate in all health professionals employed at less than 10%. Among the staff members working at each hospital, it is desirable that physicians, nurses, pharmacists, medical social workers, and physical therapists, who are in the position of advising patients about their health, medical care, and medical treatment, be nonsmokers and act as role models at an individual level. To achieve this aim, a staff questionnaire about tobacco use was administered in 2008 as a baseline investigation at the Ibaraki Prefectural Central Hospital and Cancer Center, which is a member of the JACC.

“Social nicotine dependence” is a concept describing a psychological and psychosocial state associated with smoking. That dependence was defined by Kano^{7,8)} as cognitive distortions related to smoking caused by smokers’ attempts to undervalue the harm of smoking or overvalue the favorable effects of smoking, and to justify smoking as acceptable cultural and social behavior. This psychological nicotine dependence of smokers often affects the attitude of nonsmokers and children around them, consequently influencing the social

norms regarding smoking. It can be quantified by a 10-item questionnaire, the Kano Test for Social Nicotine Dependence (KTSND). The KTSND has been widely sampled to examine its usefulness.

In the current survey, the KTSND was administered as a portion of a questionnaire designed to evaluate the attitudes of staff regarding tobacco use, with a view to formulation of adequate anti-tobacco use measures in the Ibaraki Prefectural Central Hospital and Cancer Center.

METHODS

Study Subjects

The study subjects were employees at the Ibaraki Prefectural Central Hospital and Regional Cancer Center. The questionnaire was distributed to workers in each section of the hospital. The study protocol was approved by the Review Board of the hospital.

Questionnaire (Appendix 1)

The self-administered questionnaire was distributed in June 2008, and was returned by July 2008. It included questions on demographic characteristics, such as gender and age, working years as a professional, smoking status, and exposure to second-hand smoking, and also included the KTSND. For medical doctors, nurses, and pharmacists, there was also a question regarding their practice in advising patients to quit smoking.

KTSND (Appendix 2)

The KTSND, version 2.1, consisted of 10 questions with the following instructions for the subjects: “We will ask you about your perception of smoking. Please circle the reply that best reflects your opinion.” Each question had a choice of four responses:

“Definitely Yes,” “Probably Yes,” “Probably No,” and “Definitely No.” with scores of 3, 2, 1 and 0, respectively, except for Question 1, which was scored in the reverse order. Individual item scores were added to give a total KTSND score that ranged from 0 to 30, higher scores indicating greater social dependence on nicotine.

Statistical Analysis

KTSND scores were compared among three smoking status groups, i.e., never-smokers, past smokers, and current smokers. In addition, comparisons were made among the type of jobs and the awareness of second-hand smoking. The Mann-Whitney U test was used for comparison between two groups, or the Kruskal-Wallis test for comparison among three or more groups. Logistic regression analyses were used to evaluate associations between the KTSND scores and gender, age, type of job, years working as a professional, smoking status, or awareness of second-hand smoking. Odds ratios (ORs) and their 95% confidence intervals (CIs) of high KTSND scores (≥ 10) were calculated for all types of jobs. We set the cutoff value between normal and high KTSND scores as 10, based on the result of a survey in a sample of attendees of a tobacco control meeting who were free from social nicotine dependence⁹⁾.

The multivariate model was adjusted for the above-mentioned variables with a stepwise elimination procedure. The statistical software package

PASW Statistics version 18.0 (SPSS Inc.) was used for all statistical analyses. The statistical level of significance was set at 0.05.

RESULTS

Background characteristics of subjects

The questionnaire was distributed to a total of 775 employees, and questionnaires were returned from 617 respondents (79.6%). A dataset including the type of job was available for 611 respondents (78.8%) (Table 1). The majority of respondents were female (72.9%). The highest proportion of subjects were aged 40–49 (28.9%), followed by those aged 30–39 (28.5%), 20–29 (20.7%), 50–59 (17.6%) and 60–69 (4.3%). The respondents consisted of 93 current smokers (16.0%), 95 past smokers (16.4%), and 393 never-smokers (67.6%).

Smoking rates

Smoking rates were found to vary according to gender, with 22.0% of males and 12.9% females being smokers. According to age group, the

Table 1. Background characteristics of the subjects

	Medical doctors	Nurses	Other medical workers	Clerical or on-site workers	Total
All subjects	98	334	87	256	775
Returned (%)	56 (57.1)	258 (77.2)	78 (89.7)	225 (87.9)	617 (79.6)
Replied (%)	56 (57.1)	252 (75.4)	78 (89.7)	225 (87.9)	611 (78.8)
Gender					
Males (%)	52 (92.9)	10 (4.0)	39 (50.0)	63 (28.1)	164 (27.1)
Females (%)	4 (7.1)	238 (96.0)	39 (50.0)	161 (71.9)	442 (72.9)
Missing responses	0	4	0	1	5
Age (year; Males, Females)					
20–29	13 (13, 0)	45 (5, 40)	26 (10, 16)	41 (9, 32)	125 (37, 88)
30–39	12 (10, 2)	93 (3, 90)	14 (6, 8)	53 (14, 39)	172 (33, 139)
40–49	19 (19, 0)	68 (2, 66)	23 (15, 8)	64 (20, 44)	174 (56, 118)
50–59	9 (8, 1)	39 (0, 39)	14 (7, 7)	43 (9, 34)	106 (24, 81)
60–69	3 (2, 1)	2 (0, 2)	1 (1, 0)	20 (10, 10)	26 (13, 13)
Missing responses	0	5	0	4	9
Years working in the hospital (males, females)					
2 yr or less	27 (25, 2)	38 (6, 32)	30 (11, 19)	115 (28, 87)	210 (70, 140)
3–5 yr	15 (14, 1)	35 (0, 35)	17 (7, 10)	57 (20, 37)	124 (41, 83)
6–10 yr	7 (7, 0)	41 (4, 37)	6 (4, 2)	20 (3, 17)	74 (18, 56)
11 yr +	7 (6, 1)	133 (0, 133)	24 (17, 7)	28 (12, 16)	192 (35, 157)
Missing responses	0	1	0	0	1
Smoking					
Never (%)	37 (66.1)	168 (69.4)	54 (70.1)	134 (65.0)	393 (67.6)
Past (%)	16 (28.6)	32 (13.2)	20 (26.0)	27 (13.1)	95 (16.4)
Current (%)	3 (5.4)	42 (17.4)	3 (3.9)	45 (21.9)	93 (16.0)
Missing responses	0	10	1	19	30
Second-hand smoking					
Aware (%)	44 (78.6)	190 (77.2)	64 (85.3)	162 (79.0)	460 (79.0)
None (%)	12 (21.4)	56 (22.8)	11 (16.7)	43 (21.0)	122 (21.0)
Missing responses	0	6	3	20	29

smoking rates were highest (29.7%) for males in their 20's, followed by those in their 30's, 40's, and 60's. For females, the smoking rate was 19.4% for those in their 30's, followed by those in their 40's, 20's, and 50's. The smoking rate also varied according to the type of job; it was highest (21.9%) for clerical or site maintenance workers, followed by nurses (17.4%), medical doctors (5.4%), and other medical workers (3.9%) (Table 2).

KTSND scores by smoking status

The KTSND score of current smokers (16.5 ± 5.3 , mean \pm standard deviation) was significantly higher than those of past smokers (14.0 ± 5.5) and never-smokers (11.3 ± 5.8) ($P < 0.001$). In addition, the score of past smokers was significantly higher than those of never-smokers ($P < 0.001$) (Table 3). According to the type of job, the score of smokers

Table 2. Smoking rate and distribution according to gender and age group

	Medical doctors	Nurses	Other medical workers	Clerical or on-site workers	Total
Current smokers (%)	3/56 (5.4)	42/242 (17.4)	3/77 (3.9)	45/206 (21.9)	93/581 (16.0)
Males (%)	3/52 (5.8)	5/10 (50.0)	3/39 (7.7)	25/63 (39.7)	36/164 (22.0)
Females (%)	0/4 (0.0)	37/238 (15.5)	0/39 (0.0)	20/161 (12.4)	57/442 (12.9)
Missing responses	0	4	0	1	5
Age group (year, males)					
20–29	2/13 (15.4)	3/5 (60)	1/10 (10.0)	5/9 (55.6)	11/37 (29.7)
30–39	1/10 (10.0)	1/3 (33.3)	0/6	6/14 (42.9)	8/33 (24.2)
40–49	0/19	1/2 (50.0)	1/15 (6.7)	9/20 (45.0)	11/56 (19.6)
50–59	0/8	-	1/7 (14.3)	1/9 (11.1)	2/24 (8.3)
60–69	0/2	-	0	3/10 (30.0)	3/12 (25.0)
Missing responses	-	-	-	1	1
Age group (year, females)					
20–29	-	7/40 (17.5)	0/16	2/32 (6.2)	9/88 (10.2)
30–39	0/2	19/90 (21.1)	0/8	8/39 (20.5)	27/139 (19.4)
40–49	-	8/66 (12.1)	0/8	7/44 (15.9)	15/118 (12.7)
50–59	0/1	3/39 (7.7)	0/7	3/34 (8.8)	6/81 (7.4)
60–69	0/1	0/2	-	0/10	0/13
Missing responses	-	-	-	-	-

Table 3. The Kano Test for Social Nicotine Dependence (KTSND) scores of the subjects

	Medical doctors	Nurses	Other medical workers	Clerical or on-site workers	Total
	(n = 56)	(n = 246)	(n = 77)	(n = 221)	(n = 600)
The KTSND scores of all subjects, mean \pm SD	12.6 \pm 6.4	12.0 \pm 5.9	12.6 \pm 6.1	13.1 \pm 6.0	12.6 \pm 6.0
Never-smokers	12.8 \pm 6.5	11.1 \pm 6.0 ^a	11.2 \pm 6.0 ^b	11.3 \pm 5.3 ^a	11.3 \pm 5.8 ^a
Past smokers	12.1 \pm 6.8 ^f	12.4 \pm 5.2 ^{a,f}	15.4 \pm 4.6 ^{b,f}	16.0 \pm 4.8 ^{a,f}	14.0 \pm 5.5 ^a
Current smokers	13.3 \pm 1.5 ^e	15.0 \pm 4.6 ^{a,f}	21.0 \pm 6.0 ^{b,f}	17.8 \pm 5.6 ^{a,f}	16.5 \pm 5.3 ^a
Comparison according to gender					
Males	12.6 \pm 6.5 ^e	17.3 \pm 6.2 ^{c,e}	13.9 \pm 6.7 ^e	16.2 \pm 6.5 ^{d,e}	14.5 \pm 6.7 ^d
Females	13.3 \pm 5.1	11.7 \pm 5.7 ^c	11.4 \pm 5.3	12.2 \pm 5.4 ^d	11.8 \pm 5.6 ^d
Among the never-smokers					
Males in never-smokers	12.8 \pm 6.8	17.0 \pm 11.3	11.6 \pm 7.3	12.6 \pm 6.4	12.6 \pm 6.9 ^a
Females in never-smokers	13.3 \pm 5.1	11.0 \pm 5.9	11.0 \pm 5.3	11.0 \pm 5.0	11.0 \pm 5.5 ^a
Comparison according to exposure to second-hand smoking					
No (number of respondents)	13.9 \pm 6.8 (12)	11.2 \pm 6.2 (54)	13.0 \pm 9.5 (11)	12.7 \pm 5.6 (43)	12.2 \pm 6.4 (120)
Yes (number of respondents)	12.3 \pm 6.3 (44)	12.2 \pm 5.8 (187)	12.6 \pm 5.5 (63)	13.5 \pm 6.0 (158)	12.7 \pm 5.9 (452)
Among the never-smokers					
No (number of respondents)	13.3 \pm 6.7 (7)	11.3 \pm 6.5 (41)	11.9 \pm 9.8 (9)	12.0 \pm 5.8 (31)	11.8 \pm 6.6 (88)
Yes (number of respondents)	12.7 \pm 6.6 (30)	11.0 \pm 5.8 (124)	11.2 \pm 5.1 (44)	11.1 \pm 4.9 (94)	11.2 \pm 5.5 (292)

^aThe KTSND scores were different according to smoking status (Kruskal-Wallis test, $P < 0.001$).

^bThe KTSND scores were different according to smoking status (Kruskal-Wallis test, $P < 0.01$).

^cThe KTSND scores of females were lower than those of males (Mann-Whitney U test, $P < 0.01$).

^dThe KTSND scores of females were lower than those of males (Mann-Whitney U test, $P < 0.001$).

^eThe KTSND scores of females were lower than those of males (Mann-Whitney U test, $P < 0.05$).

^fThe KTSND scores were different according to the type of job (Kruskal-Wallis test, $P < 0.05$).

^gThe KTSND scores were different according to the type of job (Kruskal-Wallis test, $P < 0.01$).

SD: Standard deviation

was significantly higher than those of past smokers and never-smokers in the groups of nurses, other medical workers, and clerical or site workers, but there were no significant differences in those of medical doctors. Comparison according to gender showed the score of females (11.8 ± 5.6) to be lower than that of males (14.5 ± 6.7) ($P < 0.001$). The significant difference in scores between males and females was seen in the groups of nurses and clerical or site workers. Among the never-smokers, there were significant differences in scores between males and females, but no significant difference was found among any types of job. The scores for those who suffered from second-hand smoking (12.7 ± 5.9) were not different from those who were unaware of the possible damage from second-hand smoking (12.2 ± 6.4). This tendency was also seen in the group of never-smokers.

Scores for each question

Table 4 shows significant differences among never-smokers, past smokers, and current smokers except for Q1 (Smoking itself is a disease). In smokers, Q10 (People can smoke at places where ashtrays are available) showed the highest score (2.49 ± 0.80), followed by Q7 (Tobacco has effects to relieve stress) (2.11 ± 0.77) and Q3 (Tobacco is one of life's pleasures). Even never-smokers and past smokers tended to answer positively to Q10 (2.08 ± 1.10 and 2.31 ± 0.5 , respectively).

KTSND scores and scores for each question for past or current smokers

The KTSND scores show significant differences among the type of jobs in past and current smokers but not in never-smokers (Table 3). Table 5 presents the significant differences among occupational category in the KTSND scores for Q5

Table 4. Scores for each question in all subjects according to smoking status

	Never-smokers (n = 384)	Past smokers (n = 94)	Current smokers (n = 88)	P-value (Kruskal-Wallis test)
	Mean \pm SD	Mean \pm SD	Mean \pm SD	
Q 1: Smoking itself is a disease	1.27 \pm 1.05	1.36 \pm 1.03	1.42 \pm 1.03	0.413
Q 2: Smoking is a part of culture	0.92 \pm 1.01	1.39 \pm 0.90	1.36 \pm 1.06	0.000
Q 3: Tobacco is one of life's pleasures	1.73 \pm 1.17	1.99 \pm 1.02	2.07 \pm 1.00	0.026
Q 4: Smokers' lifestyles may be respected	1.08 \pm 0.97	1.45 \pm 0.89	1.93 \pm 0.77	0.000
Q 5: Smoking sometimes enriches people's lives	1.05 \pm 0.98	1.31 \pm 0.96	1.45 \pm 0.93	0.000
Q 6: Tobacco has positive physical or mental effects	0.76 \pm 0.92	1.07 \pm 0.92	1.36 \pm 0.94	0.000
Q 7: Tobacco has effects to relieve stress	1.35 \pm 0.99	1.63 \pm 0.86	2.11 \pm 0.77	0.000
Q 8: Tobacco enhances the function of smokers' brains	0.57 \pm 0.73	0.81 \pm 0.85	1.00 \pm 0.87	0.000
Q 9: Doctors exaggerate the ill effects of smoking	0.53 \pm 0.75	0.65 \pm 0.79	1.23 \pm 1.00	0.000
Q 10: People can smoke at places where ashtrays are available	2.08 \pm 1.10	2.31 \pm 0.95	2.49 \pm 0.80	0.003

Table 5. The Kano Test for Social Nicotine Dependence (KTSND) scores and scores of each question of past or current smokers

	Medical doctors (n = 19)	Nurses (n = 71)	Other medical workers (n = 21)	Clerical or on-site workers (n = 71)	P-value (Kruskal-Wallis test)
	Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD	
The KTSND scores	12.26 \pm 6.21	13.70 \pm 5.03	15.67 \pm 4.55	17.15 \pm 5.40	0.001
Q 1: Smoking itself is a disease	1.05 \pm 0.97	1.31 \pm 1.01	1.24 \pm 0.94	1.61 \pm 1.05	0.109
Q 2: Smoking is a part of culture	1.26 \pm 0.99	1.23 \pm 0.94	1.81 \pm 0.81	1.44 \pm 1.02	0.096
Q 3: Tobacco is one of life's pleasures	1.95 \pm 1.27	1.86 \pm 1.12	2.29 \pm 0.72	2.14 \pm 0.87	0.499
Q 4: Smokers' lifestyles may be respected	1.47 \pm 1.07	1.58 \pm 0.94	1.52 \pm 0.75	1.89 \pm 0.73	0.105
Q 5: Smoking sometimes enriches people's lives	1.11 \pm 1.10	1.21 \pm 0.94	1.76 \pm 0.70	1.51 \pm 0.94	0.028
Q 6: Tobacco has positive physical or mental effects	0.84 \pm 0.90	1.10 \pm 0.88	1.29 \pm 1.15	1.41 \pm 0.90	0.081
Q 7: Tobacco has effects to relieve stress	1.37 \pm 0.96	1.75 \pm 0.81	1.76 \pm 1.04	2.14 \pm 0.70	0.001
Q 8: Tobacco enhances the function of smokers' brains	0.58 \pm 0.77	0.68 \pm 0.73	0.90 \pm 0.94	1.21 \pm 0.89	0.001
Q 9: Doctors exaggerate the ill effects of smoking	0.53 \pm 0.84	0.82 \pm 0.87	0.67 \pm 0.73	1.23 \pm 1.02	0.006
Q 10: People can smoke at places where ashtrays are available	2.11 \pm 1.10	2.27 \pm 0.97	2.43 \pm 0.75	2.59 \pm 0.73	0.107

(Smoking sometimes enriches people's lives), Q7 (Tobacco has effects to relieve stress), Q8 (Tobacco enhances the function of smokers' brains) and Q9. (Doctors exaggerate the ill effects of smoking).

High KTSND scores and related factors

Table 6 presents the association of variables with high KTSND scores versus normal KTSND scores. A significant association was found in the univariate models between high KTSND scores and male gender, the 40–49 yr age group, past smoker or

current smoker. In the multivariate model, the OR values (95% CI) of the high KTSND scores for the past and current smoker groups were 2.72 (1.54–4.82) and 6.11 (2.85–13.07), and significant differences were found for the 40–49 yr age group, with an OR of 0.44 (0.25–0.77).

DISCUSSION

There have been many previous studies into the smoking status of medical institution staff, but we conducted this survey, not only on medical professionals but also on non-medical staff such as

Table 6. Odds ratios of high Kano Test for Social Nicotine Dependence (KTSND) scores versus normal KTSND scores for variables in the hospital workers

Variables	Category	Univariate OR (95% CI)	Multivariate [‡] OR (95% CI)
Gender	Males	1.70 (1.12–2.59)*	
	Females	1 (reference)	
Age	< 30	1 (reference)	1 (reference)
	30–39	0.75 (0.44–1.28)	0.62 (0.35–1.10)
	40–49	0.51 (0.30–0.86)*	0.44 (0.25–0.77)*
	50+	0.62 (0.35–1.81)	0.63 (0.34–1.17)
	Type of job	Medical doctors	1 (reference)
	Nurses	1.04 (0.56–1.93)	
	Other medical workers	0.88 (0.42–1.82)	
	Clerical or on-site workers	1.26 (0.67–2.38)	
Working years as a professional	2 yr or less	1 (reference)	
	3–5 yr	0.71 (0.44–1.17)	
	6–10 yr	0.56 (0.31–1.00)	
	11 yr +	0.69 (0.45–1.07)	
	Smoking status	Never-smoker	1 (reference)
Past smoker		2.77 (1.58–4.88)***	2.72 (1.54–4.82)**
Current smoker		6.28 (2.92–13.35)***	6.11 (2.85–13.07)***
Suffered from second-hand smoking	Yes	1.32 (0.86–2.04)	
	No	1 (reference)	

High KTSND scores defined as a score of 10 or more and normal KTSND scores defined less a score less than 10.

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

[‡]Adjusted for gender, age group, type of job, working years as a professional, smoking status, exposure to second-hand smoking in a multivariate model with stepwise elimination procedure at the $P = 0.05$ significance level for entry into the model. OR: Odds ratio, CI: confidence interval

clerical or on-site workers. When nonsmoking promotion is carried out at any institution, the cooperation of all staff members is necessary, regardless of their employment capacity, as all are expected to be knowledgeable regarding this issue and to promote awareness by serving as individual role models. In the present study, the smoking rates for all staff were 22.0 % in males and 12.9 % in females, and the rates for clerical or site workers were 39.7 % in males and 12.4 % in females. The smoking rate in non-medical workers was similar to that found in the national health and nutrition examination survey in 2007, 39.4 % in males and 11.0 % in females¹⁰. The smoking rates of medical doctors in this study were 5.4 % in males and 0.0 % in women, and were lower than those reported for members of the Japan Medical Association in 2008 (15.0 % in males and 4.6 % in females)¹¹. The response rate from medical doctors was particularly low, and it is very likely that answers from smokers were not obtained, meaning that the real smoking rate would be somewhat higher. The smoking rates of nurses in the current study were 50.0 % in males and 15.5 % in females, which was similar to the 54.2 % in males and 18.5 % in females reported for the Japan Nursing Association in 2006¹². The employee smoking rates were not found to be particularly low in this institution, indicating that support for cessation of smoking for staff is necessary.

We conducted a questionnaire survey including the KTSND to evaluate attitudes toward smoking in the hospital staff, and for the purpose of clarifying disincentives to anti-smoking promotion. The ranges of mean KTSND scores according to smoking status have been reported as 10–13 for never-smokers, 12–16 for past smokers, and 16–18 for current smokers^{7, 13–18}, while the corresponding KTSND scores in our study were 11.3 for never-smokers, 14.0 for past smokers, and 16.5 for current smokers. These scores are similar and the scores for hospital workers were not particularly low.

In our survey, smokers gave strongly positive answers for Q3, Q7 and Q10, quite similar to that

of a previous study in employees of pharmaceutical companies⁷. On the other hand, not only current smokers but also never and past smokers gave a strongly positive response for Q10. Based on these results, it is necessary to remove ashtrays and abolish smoking areas to make hospitals or other public domains smoke-free.

In addition, in past and current smokers, there were significant differences among occupational category in the KTSND scores, Q5, Q7, Q8, and Q9. Past and current smokers who were clerical or site workers particularly overvalued the favorable effects of smoking compared with those who were medical doctors or nurses. In this survey, the prevalence of smoking male clerical or site workers is high as in the general population in Japan. Hasegawa et al. described differences in smoking behavior, attitude and knowledge of smoking effects among healthcare professionals¹⁹. They reported that the smoking rate of clerical workers was higher and they had less knowledge and more positive feelings toward smoking than medical doctors or nurses. To promote cessation of smoking in these employees, we should supply information not only on the harm resulting from smoking but also on misunderstandings concerning the favorable effects of smoking. On the other hand, smoking medical doctors and nurses continue to smoke although they do not recognize the favorable effects of smoking. The relationship between occupational category and KTSND scores were not suggested in previous studies in hospital workers, and the possibility of a new application of KTSND is suggested for promoting smoke-free hospitals.

Yoshii et al. proposed that KTSND scores less than 10 represent a desirable psychological state free from the influence of smoking⁹. A score of more than 10 points is regarded as a high KTSND score, and logistic regression analysis indicated a significant correlation between high KTSND scores and age and smoking status, and this tendency was similar to that observed in a previous study²⁰. In younger generations, social nicotine dependencies may be affected by promotions by tobacco com-

panies even in healthcare professionals without appropriate education about smoking in medical and nursing schools in Japan. We plan to regularly conduct surveys regarding smoking rates in the future. Although achieving a decrease in smoking prevalence requires many years, we expect that KTSND scores will decrease earlier than smoking prevalence in hospital workers.

Regarding the limitations of the study, the survey was conducted in only one medical institution. A previous study reported that KTSND scores were different in hospitals with different employee smoking rates¹³⁾. Another study showed that the KTSND reflected medical doctors' attitudes to smoking cessation in patients with lung cancer or the level of institutional tobacco control²⁰⁾. Therefore, we plan to conduct these surveys in several other regional cancer centers and longitudinally to clarify factors influencing smoking status and the KTSND scores of hospital workers. Another limitation in this survey was that smoking status was defined by self-reported answers. Biochemical assessments of smoking by-products such as cotinine or carbon monoxide are often made to validate self-reports of smoking, but a review and meta-analysis showed that those measurements are obtrusive and self-reports of smoking are accurate in most studies²¹⁾. Another limitation is the questionnaire did not include items on socio-demographic factors, lifestyle, mental health and work stress. Recently, in Japanese civil servants, one study reported a relationship between smoking behavior and socio-demographic, lifestyle, and mental health characteristics²²⁾. Arima et al²³⁾ reported the status of smoking cessation supported by nurses in general hospitals. They surveyed socio-demographics, smoking status, work-related stress, experience of learning how to support smoking cessation, knowledge about smoking hazards, and methods of assistance for quitting smoking. Consequently, they concluded that it was necessary to broaden training programs to increase self-efficacy. In our study, the questionnaire contained recognition of the Japanese Nursing Association's

anti-smoking action plan and the practice of advising patients to quit smoking, but other detailed factors were absent. Further study is therefore needed to determine the causal relationship between smoking behavior and socio-demographic factors, lifestyle, mental health and status of smoking cessation in detail.

CONCLUSIONS

This study, investigating smoking status and attitude to tobacco use in the staff of a regional cancer center, found that the smoking rate was rather high. A significant difference was seen in KTSND scores according to smoking status, and the KTSND scores differed according to the occupational category of the hospital workers. The results suggest that it is necessary to remove ashtrays and abolish smoking areas to discourage smoking in hospitals.

A part of this report was presented at the 68th Japanese Society of Public Health general meeting (October 2009, Nara).

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Appendix 1

Appendix 1

**Smoking Surveillance Questionnaire for the Staff of
Ibaraki Prefectural Central Hospital and Cancer center**

A. Questions about smoking.

We will ask you about your perception of smoking.

Please circle the reply that best reflects your opinion.

Q 1 . Smoking itself is a disease

- a. Definitely Yes b. Probably Yes c. Probably No d. Definitely No

Q 2 . Smoking is a part of culture

- a. Definitely Yes b. Probably Yes c. Probably No d. Definitely No

Q 3 . Tobacco is one of life's pleasures

- a. Definitely Yes b. Probably Yes c. Probably No d. Definitely No

Q 4 . Smokers' lifestyles may be respected

- a. Definitely Yes b. Probably Yes c. Probably No d. Definitely No

Q 5 . Smoking sometimes enriches people's lives

- a. Definitely Yes b. Probably Yes c. Probably No d. Definitely No

Q 6 . Tobacco has positive physical or mental effects

- a. Definitely Yes b. Probably Yes c. Probably No d. Definitely No

Q 7 . Tobacco has effects to relieve stress

- a. Definitely Yes b. Probably Yes c. Probably No d. Definitely No

Q 8 . Tobacco enhances the function of smokers' brains

- a. Definitely Yes b. Probably Yes c. Probably No d. Definitely No

Q 9 . Doctors exaggerate the ill effects of smoking

- a. Definitely Yes b. Probably Yes c. Probably No, d. Definitely No

Q 10 . People can smoke at places where ashtrays are available

- a. Definitely Yes b. Probably Yes c. Probably No d. Definitely No

The questionnaire continues

B. Questions about smoking status.

Please answer all in the question on the following Q1-10. Moreover, please answer Q11 and 12, Q13 and 14, and Q15 and 16 for the doctors, the nurses, and the pharmacists respectively. Time necessary for filling in is about five minutes.

Q 1 . What is your gender? 1. Female 2. Male

Q 2 . What is your age? 1. 20's 2. 30's 3. 40's 4. 50's 5. 60's or more

Q 3 . What is your employment category in this hospital?

1. Full-time 2. Part-time 3. Other (On assignment, Contract worker)

Q 4 . Do you do the business for facing to the patient? 1. Yes 2. No

Q 5 . Do you advise patients directly in your profession? 1. Yes 2. No

Q 6 What is your profession?

1. Medical Doctor 2. Nurse, Midwife, Public health nurse 3. Pharmacist
4. Laboratory medical technologist 5. Radiology technician 6. Physical therapist
7. Occupational therapist 8. Speech language pathologist 9. Dietitian
10. Other medical profession in hospital 11. Clerical or site maintenance worker

Q 7 . How long have you worked in this hospital?

1. <2 yr
2. 3-5 yr
3. 6-10 yr
4. 11 yr +

Q 8 . Do you smoke cigarettes?

1. I have never smoked or only smoked a few cigarette in my entire life
2. I smoked cigarettes but I have stopped smoking for more than one month
3. I smoke cigarettes every day

How many cigarettes do you smoke? () / day

During the next 6 months, do you want to quit smoking? 1. Yes 2. No

Do you want support to quit smoking in the hospital? 1. Yes 2. No

What kind of support do you want to quit smoking?

1. Counseling
2. Provision of nicotine gum or nicotine patch
3. Introduction to cessation clinics
4. Information about smoking cessation

Q 9. Do you have any opinion or proposal for the prohibition of smoking in this hospital at his time (August, 2006) and fill it in freely, please.

Q 10. Second-hand smoke (breathing in smoke of others' cigarettes) may cause events such as cardiac infarction, cancer, and asthma, and even a small amount is harmful.

Are you exposed to second-hand smoke in every day life? 1. Yes 2. No.

If 'Yes', where are you exposed to second-hand smoke? 1. Home 2. Office 3. School 4. Public office
5. Station 6. Car 7. Restaurant 7. Bar or tavern 8. Karaoke 9. Pachinko 10. Others

We ask only doctors, nurses, and pharmacists the following questions.

For the others the questions end here. Thank you for your cooperation.

For doctors, please answer Q 11 and Q 12.

Q 11. Do you know the smoking cessation guideline issued by nine societies including the Japanese Circulation Society?

1. Yes
2. No.

If you answered Yes above, have you ever read at least a part of the guideline?

1. Yes
2. No.

Q 12. If your patient is a smoker, what is your practice concerning smoking cessation?

1. I direct almost all patients to quit smoking
2. I direct more than half of patients to quit smoking
3. I direct about half of patients to quit smoking
4. I direct less than half of patients to quit smoking
5. I do not direct patients to quit smoking but take the opportunity to give some advice
6. I do not direct patients to quit smoking because there is no chance to give advice in my job

For nurses, please answer Q 13 and Q 14.

Q 13. The Japanese Nursing Association made action plans against smoking for nursing professionals in March, 2004. The action plan consists of two parts; the action plans against smoking, and guidance of support to quit smoking.

Do you know this action plan for nurses made by Japanese Nursing Association?

1. Yes
2. No.

If you answered Yes above, have you ever read at least a part of the action plans?

1. Yes
2. No.

Q 14. If your patient is a smoker, what is your practice concerning smoking cessation?

1. I direct almost all patients to quit smoking
2. I direct more than half of patients to quit smoking
3. I direct about half of patients to quit smoking
4. I direct less than half of patients to quit smoking
5. I do not direct patients to quit smoking but take the opportunity to give some advice
6. I do not direct patients to quit smoking because there is no chance to give advice in my job

For pharmacists, please answer Q 15 and Q 16.

Q 15. The Japanese Society of Hospital Pharmacists made a declaration to promote anti-smoking measures in December, 2007 to recognize that it was an obligation to promote measures against smoking and to support smoking cessation as professionals who protect public health.

Do you know this declaration by the Japanese Society of Hospital Pharmacists?

1. Yes
2. No.

If you answered Yes above, have you ever read at least a part of the declaration?

1. Yes
2. No.

Q 16. If your patient is a smoker, what is your practice concerning smoking cessation?

1. I direct almost all patients to quit smoking
2. I direct more than half of patients to quit smoking
3. I direct about half of patients to quit smoking
4. I direct less than half of patients to quit smoking
5. I do not direct patients to quit smoking but take the opportunity to give some advice
6. I do not direct patients to quit smoking because there is no chance to give advice in my job

End of all questions. Thank you for your cooperation.

Please submit it to the collection bag.

Appendix 2

		Definitely Yes	Probably Yes	Probably No	Definitely No
Q 1	Smoking itself is a disease	0	1	2	3
Q 2	Smoking is a part of culture	3	2	1	0
Q 3	Tobacco is one of life's pleasures	3	2	1	0
Q 4	Smokers' lifestyles may be respected	3	2	1	0
Q 5	Smoking sometimes enriches people's lives	3	2	1	0
Q 6	Tobacco has positive physical or mental effects	3	2	1	0
Q 7	Tobacco has effects to relieve stress	3	2	1	0
Q 8	Tobacco enhances the function of smokers' brains	3	2	1	0
Q 9	Doctors exaggerate the ill effects of smoking	3	2	1	0
Q 10	People can smoke at places where ashtrays are available	3	2	1	0

The maximum score is 30 points, and the minimum is zero.

地域がんセンター職員の喫煙状況と喫煙に関する意識調査 (加濃式社会的ニコチン依存度調査票を用いて)

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【目的】 今回我々は、病院職員の喫煙状況と合わせて喫煙に関する意識を加濃式社会的ニコチン依存度調査票(KTSND)を用いて調査した。

【方法】 地域がんセンターを併設する病院の職員に喫煙状況や禁煙支援の頻度等とともにKTSNDを含む自記式調査表を配布し、611名の有効回答を得て解析した。

【結果】 喫煙率は医師5.4%、看護師17.4%、他の医療職3.9%、事務・現業職21.9%であった。KTSND得点(平均値±SD)は非喫煙者11.0±5.9、前喫煙者12.2±4.7、喫煙者14.7±4.4で喫煙者では有意に高かった。職種別では非喫煙者では有意差を認めないが、喫煙経験者(前喫煙者+喫煙者)では医師12.3±6.2、看護師13.7±5.0、他の医療職15.7±4.6、事務・現業職17.2±5.4であり、医師や看護師と比較して事務・現業職で有意に高値であった。

【結論】 地域がんセンターを有するような病院では職員の喫煙率が低いことが期待されたが、実際の喫煙率はさほど低くなかった。また、職員のKTSND得点は喫煙状況や職種によっても差が見られた。禁煙推進のためには灰皿をなくし病院を敷地内禁煙にすることが必要である。

キーワード: 加濃式社会的ニコチン依存度調査票(KTSND)、喫煙、ニコチン依存、病院職員

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受付日2011年1月4日 採用日2011年10月14日