

**SMOKING RATES AND ATTITUDES TO SMOKING
AMONG MEDICAL STUDENTS:
A 2009 SURVEY AT THE NAGOYA UNIVERSITY
SCHOOL OF MEDICINE**

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ABSTRACT

Since smoking is implicated in many diseases, medical professionals are expected to contribute to the reduction of smoking rates in their practice. Medical students are also expected to learn the importance of practical measures against smoking. This study surveyed the smoking rates and attitudes to smoking among medical students of the Nagoya University School of Medicine. Out of 612 students in their 1st to 6th year in 2009, 31 students answered "yes" to the question "Did you smoke one or more cigarettes this past month?" and eight students did not respond. The maximum smoking rate was 6.4% (39/612). The respective rates of students to accept smoking by doctors, co-medical personnel, patients in general, and terminally ill patients were 50.8% in males and 38.9% in females, 51.3% in males and 41.6% in females, 41.4% in males and 23.0% in females, 80.5% in males and 84.1% in females. This survey demonstrated that though smoking rates among medical students were relatively low, many accepted smoking, especially for terminally ill patients.

Key Words: Smoking rate, Attitude to smoking, Medical student, Anonymous survey

INTRODUCTION

Smoking is implicated in a substantial number of diseases, including hypertension, cerebrovascular disease, cardiovascular disease, cancers of the oral cavity, larynx, lung and esophagus, chronic obstructive pulmonary disease, and digestive ulcer.^{1,2)} The population attributable risk percent estimated from Japanese cohort studies for mortality from all causes was 27.8% in males and 6.7% in females.³⁾ In order to reduce the rates of morbidity/mortality, medical professionals are expected to incorporate efforts to reduce smoking in their practice. Several cessation treatments have been covered by medical insurance in Japan since 2006, though some restrictions may apply.

Smoking is very common worldwide; according to the 2002 WHO Tobacco Atlas, the rate of male adult smokers was 48% in Southeast Asia, 43% in other Asian regions, 38% in Europe,

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and 35% in North America, while that of female adult smokers was 11%, 11%, 23%, and 21%, respectively. Smoking rates among the Japanese population aged 20 years or over in 2007 were reported to be 39.4% in males and 11.0% in females.⁴⁾ According to a survey of the Japan Medical Association, smoking rates among medical doctors in 2004 were 21.5% in males and 5.4% in females.⁵⁾ Among 1,133 dentists in Hyogo Prefecture, the rate was 28.9% in a 2003 survey.⁶⁾ In a cohort study of dentists, the rate during 2001 to 2006 was 30.2% in males and 10.7% in females at enrollment.⁷⁾ Surveys among the members of the Japan Cancer Association documented that the rate was 5.9% in 2004 and 9.0% in 2006.⁸⁾

The smoking rate among medical students has been surveyed on many occasions, but the accessible reports were limited, especially those in English. This current survey was conducted among medical students of the Nagoya University School of Medicine in 2009 with the aim of documenting the percentage of smokers and their attitudes toward smoking. This questionnaire survey was approved by the Ethics Committee of the Nagoya University School of Medicine (approval number 761).

MATERIALS AND METHODS

Subjects

Subjects were 1st- to 6th-year medical students at the Nagoya University School of Medicine in 2009. There were 619 students in total, excluding two who were absent from classes over a long period. Seven others did not respond to the questionnaire due to their absence during the survey period. The questionnaires from the remaining 612 students were available for analysis.

Methods

This study was conducted by the Student Life Committee. An anonymous questionnaire was distributed in class by one of the teaching staff. Two envelopes were used for conducting the anonymous survey. The outer envelope with their name was used to verify their participation, while the inner envelope was anonymous. The students were requested to submit their completed questionnaires to the Office of Student Affairs. The office first checked the names on the outer envelope, which was then opened; the inner envelope containing the anonymous questionnaire was sent to the staff person in charge of the survey. The questionnaire was distributed in April to the 4th-year medical students after a series on classes of preventive medicine, including a lecture on treatments for smoking cessation. In May, it was distributed to 1st-, 2nd-, 3rd-, and 5th-year students, and in July to the 6th-year students. The class attendance rate of the 4th-year students to the class on smoking cessation treatments was roughly 80%.

Questionnaire

Although it was an anonymous survey, questions regarding the respondent's grade, sex, and age were included in the questionnaire. The contents of the questionnaire are listed in the Appendix. For those who answered "no" to the first question "Have you smoked more than 100 cigarettes in the past?", questions 2 to 13 were not asked, and were ignored in the analysis. Those respondents were categorized as never smokers. Those who answered "yes" to the first question were categorized as ever smokers, and were asked to respond to second question "Have you smoked one or more cigarettes in this past month?" was asked. If they answered "no", questions 3 to 13 were not asked, whereas those who answered "yes" to the second question were categorized as current smokers.

Fagerstrom test for nicotine dependence (FTND) with six questions⁹⁾ (questions 3 and 5–9 in

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the questionnaire) was used in the questions for current smokers to determine their degree of nicotine dependence. The degrees were classified into 0–4 points (mild), 5–7 points (intermediate), and 8–10 points (heavy).

Statistical analysis

Percentages between the two groups were tested using Fisher's exact test. The 95% confidence intervals (95%CI) were calculated based on a binomial distribution. The calculations were performed with STATA Version 11 (STATA Corporation, College Station, TX).

RESULTS

Smoking rate

The respondents to the questionnaire survey totalled 612 students (98.9% of 619) in three groups; 478 males, 113 females, and 21 sex-unspecified (two in 1st year, four in 2nd year, three in 3rd year, nine in 4th year, one in 5th year, and two in 6th year). The ages of the eldest students were 31 years, 54 years, 38 years, 34 years, 35 years, and 32 years, respectively. The age distributions according to year are shown in Table 1.

Among the respondents, eight students (one 2nd-year female, one sex-unspecified 3rd-year student, one 4th-year male, and five sex-unspecified 4th-year students) did not answer the questions regarding their smoking habits. Ever smokers numbered 48 (7.8%, 95% CI 5.8–10.2%) and current smokers 31 (5.1%, 95% CI 3.5–7.1%). When the eight students who did not address their smoking habits were regarded as smokers, ever smokers rose to 56 (9.2%, 95% CI

Table 1 Sex and age distributions of 612 respondents

Student year	Age in years										Total
	18	19	20	21	22	23	24	25	26≥	NS	
Males											
1st year	36	25	6	0	2	0	2	1	7	0	79
2nd year	0	36	21	5	4	2	0	0	6	1	75
3rd year	0	0	42	24	10	4	0	0	4	1	85
4th year	0	0	0	37	26	6	2	0	4	1	76
5th year	0	0	0	0	29	25	8	4	8	1	75
6th year	0	0	0	0	0	35	27	11	15	0	88
Subtotal	36	61	69	66	71	72	39	16	44	4	478
Females											
1st year	11	7	1	0	0	0	1	0	0	0	20
2nd year	0	17	3	1	1	0	0	0	1	0	23
3rd year	0	0	9	2	1	0	0	0	0	0	12
4th year	0	0	0	15	3	0	1	0	2	0	21
5th year	0	0	0	0	13	4	2	0	1	0	20
6th year	0	0	0	0	0	9	5	1	2	0	17
Subtotal	11	24	13	18	18	13	9	1	6	0	113
Sex NS	0	4	0	1	0	1	0	0	1	14	21
Total	47	89	82	85	89	86	48	17	51	18	612

NS: not specified

Table 2 Number of smokers by student year among respondents

Student year	Males			Females			NS
	N	Ever (%)	Curr. (%)	N	Ever (%)	Curr. (%)	
1st year (n=101)	79	3 (3.8)	3 (3.8)	20	0 (0.0)	0 (0.0)	2
2nd year (n=102)	75	4 (5.3)	2 (2.7)	23	2 (8.7)	2 (8.7)	4
3rd year (n=100)	85	6 (7.1)	4 (4.7)	12	0 (0.0)	0 (0.0)	3
4th year (n=106)	76	4 (5.3)	2 (2.6)	21	0 (0.0)	0 (0.0)	9
5th year (n=96)	75	9 (12.0)	6 (8.0)	20	1 (5.0)	0 (0.0)	1
6th year (n=107)	88	17 (19.3)	10 (11.4)	17	0 (0.0)	0 (0.0)	2
Total (n=612)	478	43 (9.0)	27 (5.6)	113	3 (2.7)	2 (1.8)	21

Ever: those having responded “yes” to the question “Have you smoked more than 100 cigarettes in the past?”, Curr.: among ever smokers, those having responded “yes” to the question “Have you smoked one or more cigarettes in the past month?”, and NS: not specified in the questionnaire. One 4th-year male and one 2nd-year female did not respond to question on his/her smoking habits. Among 21 sex-unspecified students, two (one in 4th year and one in 6th year) admitted being current smokers. In total, there were 48 ever smokers, 31 of whom were current smokers.

Table 3 Scores of the Fagerstrom Test for Nicotine Dependence (FTND) for current smokers

Student year	Males					Females					NS
	M	I	H	NS	Total	M	I	H	NS	Total	
1st year	2	1	0	0	3	0	0	0	0	0	0
2nd year	2	0	0	0	2	2	0	0	0	2	0
3rd year	4	0	0	0	4	0	0	0	0	0	0
4th year	1	0	1	0	2	0	0	0	0	0	1
5th year	4	2	0	0	6	0	0	0	0	0	0
6th year	8	1	0	1	10	0	0	0	0	0	1
Total	21	4	1	1	27	2	0	0	0	2	2

NS: not specified in the questionnaire. M: mildly dependent (0–4 points), I: intermediately dependent (5–7 points), and H: heavily dependent (8–10 points). FTND scores for the sex-unspecified students were 5 points for 4th-year student and 0 point for 6th-year student.

7.0–11.7%) and current smokers to 39 (6.4%, 95% CI 4.6–8.6%). As shown in Table 2, among the ever smokers there were 43 males (9.0%, 95% CI 6.6–11.9%) and 3 females (2.7%, 95% CI 0.6–7.6%). Of those, 27 males (5.6%, 95% CI 3.8–8.1%) and 2 females (1.8%, 95% CI 0.2–6.2%) were current smokers. There were two sex-unspecified current smokers among 4th- and 6th-year students. In males, the smoker rate was highest in 6th-year students.

The data for FTND scoring were available for 30 out of 31 current smokers (Table 3). Eight points of one 4th-year male was the highest. Mild dependence (0–4 points) was in the majority (24 smokers).

Attitudes toward smoking

As shown in Table 4, students accepting of smoking (A1 and A2 in Table 4) by doctors, co-medical personnel, patients in general, and terminally ill patients were, respectively, 50.8% in males and 38.9% in females, 51.5% in males and 41.6% in females, 41.4% in males and 23.0% in females, and 80.3% in males and 84.1% in females. The difference in the rates between male and female students was significant for doctors and patients in general; the p-value was 0.028,

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Table 4 Attitudes toward smoking

Student year	Males					Females					NS	Total
	A1	A2	A3	A4	NS	A1	A2	A3	A4	NS		
Q14 Smoking by doctors												
1st year	32	6	39	2	0	5	1	14	0	0	2	101
2nd year	37	2	33	2	1	5	1	15	2	0	4	102
3rd year	40	7	37	1	0	4	3	5	0	0	3	100
4th year	33	4	37	1	1	7	2	11	0	1	9	106
5th year	30	2	37	6	0	5	2	13	0	0	1	96
6th year	44	6	34	4	0	6	3	7	1	0	2	107
Total	216	27	217	16	2	32	12	65	3	1	21	612
Q15 Smoking by co-medical personnel												
1st year	32	6	39	2	0	5	1	14	0	0	2	101
2nd year	37	4	30	4	0	6	1	15	1	0	4	102
3rd year	40	6	37	2	0	4	2	6	0	0	3	100
4th year	31	5	38	1	1	8	2	10	0	1	9	106
5th year	31	2	36	6	0	7	1	12	0	0	1	96
6th year	46	6	32	4	0	7	3	6	1	0	2	107
Total	217	29	212	19	1	37	10	63	2	1	21	612
Q16 Smoking by patients in general												
1st year	23	22	34	0	0	2	2	15	1	0	2	101
2nd year	20	15	38	2	0	1	5	17	0	0	4	102
3rd year	24	9	50	2	0	3	2	7	0	0	3	100
4th year	22	7	45	1	1	3	1	15	1	1	9	106
5th year	12	5	53	5	0	1	1	18	0	0	1	96
6th year	25	14	46	3	0	0	5	12	0	0	2	107
Total	126	72	266	13	1	10	16	84	2	1	21	612
Q17 Smoking by terminally ill patients												
1st year	54	10	12	3	0	9	5	4	2	0	2	101
2nd year	49	11	11	4	0	16	4	1	2	0	4	102
3rd year	57	16	9	3	0	8	3	1	0	0	3	100
4th year	51	7	15	2	1	16	4	0	0	1	9	106
5th year	41	9	18	7	0	10	4	6	0	0	1	96
6th year	59	20	6	3	0	10	6	0	1	0	2	107
Total	311	73	71	22	1	69	26	12	5	1	21	612

A1: "Up to their discretion", A2: "No problems as long as patients are not aware" for Q14 and Q15 and "Cessation advise is not necessary" for Q16 and Q17, A3: "Should not smoke" for Q14 and Q15 and "I want to advise cessation" for Q16 and Q17, A4: "I can't judge", and NS: not specified. See the Appendix for the details.

0.061, <0.001, and 0.424, respectively.

Among the 31 current smokers, 80.6% accepted smoking by doctors, 83.9% by co-medical personnel, 64.5% by patients in general, and 87.1% by terminally ill patients. The percentages among current smokers were significantly higher than those among never smokers except for patients who were terminally ill; 46.8% ($p<0.001$), 46.9% ($p<0.001$), 36.3% ($p=0.002$), and 80.0% ($p=0.485$), respectively.

Knowledge about cessation treatments

In recent years, cessation treatments have been taught to 4th-year students in a preventive medicine class, as well as in a seminar for 12 1st-year students. As shown in Table 5, the students who showed some familiarity with the contents of cessation treatments were 7 (6.9% of 101) in 1st year, 22 (21.6% of 102) in 2nd year, 11 (11.0% of 100) in 3rd year, 36 (34.0% of 106) in 4th year, 36 (37.5% of 96) in 5th year, and 25 (23.4% of 107) in 6th year. For specific questions on treatments, students who professed to know where to obtain and how to

Table 5 Knowledge of cessation treatments

Studentyear	Males				Females				NS				Total
	A1	A2	A3	NS	A1	A2	A3	NS	A1	A2	A3	NS	
Q18 Cessation treatments													
1st year	6	21	52	0	1	7	12	0	0	1	1	0	101
2nd year	15	16	43	1	7	4	12	0	0	0	4	0	102
3rd year	10	14	60	1	1	2	9	0	0	0	2	1	100
4th year	26	23	26	1	6	7	7	1	4	1	0	4	106
5th year	29	21	25	0	6	8	6	0	1	0	0	0	96
6th year	19	41	28	0	6	5	6	0	0	1	0	1	107
Total	105	136	234	3	27	33	52	1	5	3	7	6	612
Q19 Nicotine gum													
1st year	34	40	5	0	8	12	0	0	0	2	0	0	101
2nd year	30	40	5	0	11	12	0	0	1	3	0	0	102
3rd year	29	52	4	0	4	7	1	0	1	1	0	1	100
4th year	48	27	0	1	10	10	0	1	2	2	1	4	106
5th year	47	25	3	0	13	7	0	0	1	0	0	0	96
6th year	45	42	1	0	7	10	0	0	0	1	0	1	107
Total	233	226	17	1	53	58	1	1	5	9	1	6	612
Q20 Nicotine patch													
1st year	32	36	11	0	6	12	2	0	1	1	0	0	101
2nd year	29	35	11	0	11	11	1	0	1	3	0	0	102
3rd year	30	49	6	0	3	8	1	0	1	1	0	1	100
4th year	45	29	1	1	10	10	0	1	2	2	1	4	106
5th year	47	26	2	0	11	9	0	0	1	0	0	0	96
6th year	46	41	1	0	7	10	0	0	0	1	0	1	107
Total	229	216	32	1	48	60	4	1	6	8	1	6	612
Q21 Varenicline													
1st year	5	8	66	0	0	2	18	0	0	0	2	0	101
2nd year	8	10	57	0	4	4	15	0	0	1	3	0	102
3rd year	4	9	72	0	0	1	11	0	0	1	1	1	100
4th year	25	38	12	1	4	13	3	1	1	2	2	4	106
5th year	7	28	40	0	1	8	11	0	0	0	1	0	96
6th year	14	22	52	0	1	5	11	0	0	1	0	1	107
Total	63	115	229	1	10	33	69	1	1	5	9	6	612

A1: "Yes, I know the contents" for Q18 and "Yes, I know where to obtain it and how to use it" for Q19 to Q21, A2: "Yes, but I don't know the contents at all" for Q18 and "Yes, but only by name" for Q19 to Q21, A3: "No", and NS: not specified. See the Appendix for the details.

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use them were: 42 (41.6%), 42 (41.2%), 34 (34.0%), 60 (56.6%), 61 (63.5%), and 52 (48.6%) for nicotine gum; 39 (38.6%), 41 (40.2%), 34 (34.0%), 57 (53.8%), 59 (61.5%), and 53 (49.5%) for nicotine patch; 5 (5.0%), 12 (11.8%), 4 (4.0%), 30 (28.3%), 8 (8.3%), and 15 (14.0%) for varenicline. Except for varenicline, those percentages were higher among 4th- to 6th-year students than among 1st- to 3rd-year students. Knowledge about varenicline was relatively common among 4th-year students, for whom a class on smoking cessation treatments had been held five days before the survey.

DISCUSSION

Smoking rates were 5.6% in male students and 1.8% in female students (5.1% of 612 respondents). When those not having answered the questions on smoking habits were regarded as current smokers, the rate was 6.4%. Heavily dependent students were rare. There were many students who accepted smoking by medical professionals and patients. Male students accepting smoking were more frequent than female students; smoking by doctors (50.8% and 38.9%, $p < 0.05$) and by patients in general (41.4% and 23.0%, $p < 0.001$). Knowledge of cessation treatments was more common among 4th- to 6th-year students than among 1st- to 3rd-year students, except for varenicline.

Although there were numerous surveys on smoking rates among medical students, their published reports were limited, especially in English. A study of 2nd- and 5th-year students from 12 medical schools in the Tokyo metropolitan area from 1996 to 1998 demonstrated that smokers were 25.1% in 2nd-year males, 8.8% in 2nd-year females, 43.1% in 5th-year males, and 9.3% in 5th-year females.¹⁰⁾ In a survey by the Hokkaido University School of Medicine in 2003 with a response rate of 61.3%, the smoking rate was 12.2% for 285 male students and 3.8% for 79 female students.¹¹⁾ Another study reported that the smoking rate in 2007 was 22.1% for male students and 4.0% for female students, which was lower than that in 2001 (38.2% and 11.6%, respectively) before the entire campus was designated a non-smoking area in 2004.¹²⁾ The present study of students in the Nagoya University School of Medicine in 2009 revealed the lowest smoking rate for medical students among those reported so far. On the medical school campus of Nagoya University, smoking was prohibited in April 2007. Since this was a cross-sectional study, the effects of education in the medical school on the smoker percentages were not clear. Although eight students who did not answer the questions on smoking habits might be smokers, it seems unlikely that smokers would respond as non-smokers, since the survey was conducted anonymously. Accordingly, the estimated percentages of smokers may more likely be at maximum. In addition to the low smoking rate, the rate of mild nicotine dependence among the smokers indicated the possibility of a further reduction of smokers among the students.

More than half of the male students accepted smoking by doctors (50.8%), co-medical personnel (51.5%), and terminally ill patients (80.3%). These percentages were higher than those reported for members of the Japanese Cancer Association, in which 9.9% of 920 respondents answered “no” to the question “Do you agree that the medical staff should not be allowed to smoke?”⁸⁾ In addition, that study showed that the percentage was higher among 83 current smokers (33.7%) than among the 564 never smokers (6.4%). The present survey showed a similar trend among current smokers, who were more likely to accept smoking by medical professionals and patients in general. Since medical doctors are expected to play a role in reducing smokers, attitudes against smoking should be encouraged as an integral element in the medical school curriculum.

Knowledge of cessation treatments was evaluated by asking their recognition, rather than by

testing their knowledge of treatments. While recognition may not reflect the actual knowledge, tests may include guessing without the knowledge. In any case, since their knowledge of cessation treatments was insufficient, effective instruction in smoking cessation classes will be needed.

In conclusion, this study, with a response rate of 98.9%, determined that the smoking rate among the medical students of Nagoya University was 6.4% at a maximum, though many of them accepted smoking by medical professionals and patients. Further education will be required to reduce the rate of smokers and to alter current student attitudes as an integral element in the curriculum.

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Appendix: Questions in the applied questionnaire (the Japanese version will be provided upon request from nhamajim@med.nagoya-u.ac.jp)

- Q1. Have you smoked more than 100 cigarettes in the past?
1) Yes 2) No
- Q2. Have you smoked one or more cigarettes in the past month?
1) Yes 2) No
- Q3. How many cigarettes did you smoke daily on average in the past month?
1) 4 cigarettes or less 2) 5–9 cigarettes 3) 10–19 cigarettes
4) 20–29 cigarettes 5) 30 cigarettes or over
- Q4. When did you start smoking?
- Q5. How soon do you smoke your first cigarette after waking?
1) Within 5 minutes 2) 6–30 minutes 3) 31–60 minutes 4) 60 minutes later
- Q6. Do you have difficulty in refraining from smoking in a non-smoking area?
1) Yes 2) No
- Q7. When do you have the greatest difficulty in refraining from smoking?
1) Just after waking 2) On other occasions
- Q8. When do you smoke more frequently? In the morning or during the rest of the day?
1) In the morning 2) During the rest of the day
- Q9. Do you smoke when you are so ill that you are bedridden most of the day?
1) Yes 2) No
- Q10. Have you ever tried to quit smoking?
1) Never 2) Once 3) 2–4 times 4) 5 times or more
- Q11. Are you interested in giving up smoking?
1) No 2) Yes, but I have no intention of quitting
3) I am thinking to quit smoking, but not within a month
4) I am thinking about quitting within a month.
- Q12. Do you think that your family members living with you want you to quit smoking?
1) Yes 2) No 3) I have no idea 4) I do not presently live with my family
- Q13. How many family members beside you smoke in your house?
1) None 2) One 3) Two or more 4) I live alone at present
- Q14. What do you think about smoking by doctors?
1) Up to their discretion
2) No problems as long as patients are not aware
3) Should not smoke 4) I can't judge
- Q15. What do you think about smoking by co-medical personnel?
1) Up to their discretion
2) No problems as long as patients are not aware
3) Should not smoke 4) I can't judge
- Q16. What do you generally think about smoking by patients
1) Up to their discretion 2) Cessation advice is not necessary
3) I want to advise cessation 4) I can't judge
- Q17. What do you think about smoking by terminally ill patients?
1) Up to their discretion 2) Cessation advice is not necessary
3) I want to advise cessation 4) I can't judge
- Q18. Do you know that cessation treatments are covered by health insurances?
1) Yes, I know the contents
2) Yes, but I don't know the contents at all
3) No
- Q19. Do you know about nicotine gum?
1) Yes, I know where to obtain it and how to use it
2) Yes, but only by name 3) No. This is the first I've heard of it
- Q20. Do you know about nicotine patch?
1) Yes, I know where to obtain it and how to use it
2) Yes, but only by name 3) No. This is the first I've heard of it
- Q21. Do you know about varenicline?
1) Yes, I know where to obtain it and how to use it
2) Yes, but only by name 3) No. This is the first I've heard of it