RESEARCH COMMUNICATION

A Large-scale Follow-up Study of Smokers Visiting Medical Facilities in Japan

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Abstract

In order to determine smoking cessation rates among those who visit medical facilities in Japan, a large-scale follow-up study was conducted. Subjects were self-reported smokers who visited a cancer hospital, a general hospital, or one of four health checkup facilities in 1997-98. Their smoking habits were followed by two postal surveys. The first was two months after the visit to hospital or attendance at a health checkup screening, and the second was after one year. In total, 3,552 smokers participated in the present study; 1,131 first visit outpatients at a cancer hospital, 214 first visit outpatients at a general hospital, and 2,207 examinees at four health checkup facilities. The response rate for the first follow-up varied from 57.3% to 80.2% of the eligible participants in the six facilities, and that for the second from 50.0 to 67.1%. When non-respondents were classified as non-quitters, the cessation rate two months after their participation was 11.7% (95% confidence interval, 7.4-16.0%) for the general hospital and 2.7% (2.1-3.5%) for the four health checkup facilities, and those after one year were 9.8% (6.2-14.6%) and 6.0% (5.1-7.1%), respectively. In the cancer hospital, the rate for self-reported cancer patients was 74.6% (68.5-80.0%) after two months and 51.3% (44.7-57.9%) one year later. The smoking cessation rate was thus smaller in the health checkup examinees than in the patients. Outpatients seemed to be more amenable to smoking cessation, and therefore may constitute a more appropriate target for cessation programs.

Key words: Follow-up -smokers - health check-up - cessation rate - medical facility type

Asian Pacific J Cancer Prev, **2**, 185-191

Introduction

Japan is one of the countries where the percentage of smokers is still notoriously high. The percentage of people smoking among those aged 20 years or over in 1995 was reported by the National Survey on Nutrition to be 52.7% in males and 10.6% in females (Health and Welfare Statistics Association, 1997). It has been estimated that considerable numbers of cigarettes are now being consumed by adolescents (Osaki et al., 1999). Nevertheless, only 8 out of 47 prefectural branches of the Japan Medical Association ran a program against smoking in a 1997 survey (Kawane, 1998). Although some progress has been made against smoking by governmental initiatives, such as the "Guideline against Smoking at Worksites" issued in 1996, and a complete ban on TV adverting since April 1998, the pace has been too slow to control tobacco-related diseases in an effective way (Nakamura, 1998).

Smoking cessation programs are still underdeveloped at worksites and medical facilities in Japan, and are available at only a limited number of facilities. A few studies have been conducted to evaluate the effectiveness of educational sessions for outpatients (Ogawa et al., 1993) and health checkup examinees (Shimizu et al., 1985), finding a small or moderate effect in the intervention group when compared with the control; 20% vs 9% for a five-month cessation rate (Ogawa et al., 1993), and 8% vs 4% for a six-month cessation rate (Shimizu et al., 1985), respectively. Nicotine gum was

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approved in Japan as a prescription drug in 1994, ten years after its approval in the United States (Henningfield, 1995). Nicotine patches were also approved in December 1998, but prescription by physicians is similarly required. To date, nicotine replacement is not covered by any health insurance funds, resulting in expense for smokers trying to quit. Although over-the-counter (OTC) nicotine medications are effective in increasing the number of quitters (Fiore et al., 1994, Shiffman et al., 1997), nicotine products are not available as over-the-counter drugs at present in Japan.

With this background, a project to establish comprehensive smoking cessation support based in medical facilities was launched in 1997 in the Nagoya metropolitan area (principal investigator, Nobuyuki Hamajima, MD, MPH), supported by a grant from the Ministry of Health, Labor and Welfare, Japan. The project comprises 1) a baseline survey of smoking cessation rates for outpatients and health checkup examinees subject to no or negligible intervention, 2) monitoring smoking cessation rates under economical intervention by pamphlets and/or video, 3) introduction of recommendations such as the Smoking Cessation Clinical Practice Guideline of the US Agency for Health Care Policy and Research (The Smoking Cessation Clinical Practice Guideline Panel and Staff, 1996), 4) developing an effective standardized method for nicotine replacement therapy, and 5) establishing a network of medical facilities providing smoking cessation programs. This paper reports the results of the baseline survey of smoking cessation rates for those who visited a medical facility which provided no or negligible cessation support.

Subjects and Methods

Subjects

This was a cooperative study involving two hospitals and four health checkup facilities; a cancer hospital with a 500 inpatient treatment capacity which 6,140 new patients visited in 1998 (Aichi Cancer Center Hospital: ACCH), a general hospital with a 330 inpatient treatment capacity which 32,605 new outpatients visited in 1998 (Hekinan Municipal Hospital: HMH), two health checkup centers (Hekinan Municipal Health Center: HMHC, and Anjo Municipal Health Center: AMHC), and two local authority health departments which provide portable health checkup services mainly for the aged (Nagoya Nakamura Health Center of Nagoya Municipal Government: NNHC, and Gifu Health Department of Gifu Municipal Government: GHD). The enrollment started on September 15, 1997, at ACCH, July 1, 1998, at GHD, and April 1, 1998, at the other four facilities, and closed September 11, 1998 at ACCH, and March 31, 1999 at the others.

In ACCH, all first-visit outpatients were asked at the reception desk to participate in a lifestyle questionnaire survey called HERPACC (Hospital-based Epidemiologic Research Program at Aichi Cancer Center) (Tajima et al., 2000). Smokers identified in the questionnaire were asked to participate in the follow-up study. The doctors in charge did not give them any standardized advice against smoking. In HMH, a few internal doctors in charge of enrollment asked first visit smoker outpatients to participate in the follow-up study at their clinics. Some patients with smoking related diseases were given simple advice not to smoke. In HMHC, AMHC, and GHD, the examinees were requested to complete a symptom questionnaire form including smoking behavior. Smokers were asked to attend the follow-up study in the course of examination. In NNHC, those with a risk of some disease or those who wished to see a doctor were guided to the doctor in charge of enrollment for the study. She checked their smoking behavior, and asked the examinees to participate in the study if they were smokers.

No formal or programmed support in quitting smoking were provided at any facilities, just like in the other facilities in Japan. However, in ACCH and GHD, a brief pamphlet was handed out for smokers without any instruction and/or counseling. All participants completed a registration form including name, sex, age, and address, after an explanation of the follow-up schedule.

Follow-up

All consent forms were sent to the study office at Aichi Cancer Center Research Institute. Seven weeks after entry, the office mailed the first questionnaire to the participants. The questionnaire consisted of the following questions: 1) whether diseased or not, or disease had diagnosed; 2) smoking habit and number of cigarettes per day; 3) past quit-smoking attempts among those still unable to quit; and 4) question to determine the stage of abstinence preparation among non-quitters (Prochaska, 1992). A second request letter for the first follow-up was not mailed to non-respondents. The second follow-up asking only current smoking habit was conducted for all participants one year after entry. Except for the participants at ACCH, no further requests were mailed to the non-respondents.

Statistical analysis

Percentage differences were tested by the chi-square test, and 95% confidence intervals were calculated with a binomial distribution. An unconditional logistic model was applied for analysis of factors associated with smoking cessation. The calculations were performed with the computer program STATA Version 7 (STATA Corporation, College Station, TX).

Results

Participation and response rate

Table 1 shows the numbers of smokers who visited a facility, smokers who were asked to participate, actual participants, and eligible participants at the two-month and one-year surveys. Those who had given wrong addresses or had been reported dead by their families were excluded as being ineligible. In HMH and NNHC, there were no systems to identify smokers, so the number or smokers who visited these facilities was not available. In ACCH and HMH, the

Table 1. Number of Participants According to Medical Facility

Facility	Entry period	Smokers			Eligible	
		Visitor	Invited	Partic.	2 mo.	1 year
Aichi Cancer Center Hosp.	97/9-98/9	1,304	NC	1,131	1,124	1,055
Hekinan Muni. Hosp.	98/4-99/3	NC	NC	214	214	214
Hekinan Muni. H. Ctr.	98/4-99/3	669	628	392	391	390
Anjo Muni. H. Ctr.	98/4-99/3	929	897	642	639	637
Nagoya Nakamura H. Ctr.	98/4-99/3	NC	446	440	435	435
Gifu H. Dept.	98/7-99/3	1,103	1,103	733	730	728
Total				3,552	3,533	3,459

Partic.: Participants, mo.: month, NC: not counted, Hosp.: Hospital, Muni.: Municipal, H.: Health, Ctr.: Center, and Dept.: Department

number of smokers invited to take part in the follow-up study was not counted precisely. In ACCH, tens of smokers did not hand HERPACC questionnaires directly to the interviewer in charge, so the chance to ask them to participate was lost. The rest were smokers who explicitly refused to participate. Reasons for refusal were not systematically asked, but no interest in the study, no will to quit smoking, anxiety about the disclosure of hidden smoking to husbands, worry about neighbors' noticing envelopes from ACCH, and the family's refusal in case of advanced stages of cancer, were reported. The refusal percentage was 13.3% (173/1,304) at ACCH, when those not asked to participate were classified as refusers. In HMH, refusers were fewer because medical doctors treating the smokers asked for their participation. The refusal percentages were 37.6% (236/628) in HMHC, 28.4% (255/897) in AMHC, 1.3% (6/446) in NNHC, and 33.5% (370/1103) in GHD. As mentioned above, in NNHC, selected smokers were asked for their participation.

In total, 3,552 smokers participated in the follow-up study. By the end of a 2-month follow-up, 2 participants at ACCH were reported to be dead from cancer, 16 participants were found to have written a wrong address on the registration form, and 1 participant was found to be an ex-smoker, resulting in 3,533 eligible participants. By the one-year survey, another 74 participants were found to be dead or have changed their address. Sex and age distributions for the 3,533 eligible participants are shown in Table 2. In ACCH, those aged younger than 40 years were 16.2% of males and 40.7% of females, while in HMH these were 41.4% and 66.7%, respectively. In HMHC and AMHC, the majority of examinees were middle aged, while the majority were 50 years old or over in NNHC and GHD.

The response rates for both sexes combined at the first follow-up were 57.3% (644/1124) for ACCH, 59.3% (127/214) for HMH, 74.7% (292/391) for HMHC, 71.5% (457/639) for AMHC, 80.2% (349/435) for NNHC, and 76.4% (558/730) for GHD. The combined rate for the two hospitals (57.5%) was significantly lower ($p<0.001$) than that for the four health checkup facilities (74.5%). In all the facilities except NNHC, the response rate was higher among males than among females; 62.1% and 47.4% in ACCH, 64.1% and 33.3% in HMH, 75.5% and 60.9% in HMHC, 73.5% and 60.4% in AMHC, 79.8% and 81.7% in NNHC, and 80.7% and 65.2% in GHD, respectively. At the second follow-up one year after entry, the response rates were 66.7% (704/1055), 50.0% (107/214), 63.6% (248/390), 61.5% (392/637), 67.1% (292/435), and 66.6% (485/728), respectively. In all facilities, the response rate was higher in male smokers than in female smokers.

Table 2. Sex and Age Distributions as Percentages of Participants by Medical Facility Eligible at the Two-month Survey

Age	Medical facilities											
	ACCH		HMH		HMHC		AMHC		NNHC		GHD*	
	M	F	M	F	M	F	M	F	M	F	M	F
	n=755	369	181	33	368	23	543	96	331	104	529	201
-29	5.6	20.6	16.0	48.5	6.5	8.7	9.4	13.5	0.0	0.0	1.3	2.0
30-39	10.6	20.1	25.4	18.2	24.2	21.7	20.3	20.8	4.5	12.5	6.6	15.4
40-49	20.0	29.5	24.3	15.2	34.2	39.1	23.8	27.1	11.5	16.3	15.3	22.9
50-59	27.7	19.0	18.2	15.2	25.5	21.7	20.8	16.7	17.2	37.5	16.3	29.9
60-	36.0	10.6	16.0	3.0	9.5	8.7	25.8	21.9	66.8	33.7	60.3	29.4

ACCH:Aichi Cancer Center Hospital, HMH:Hekinan Municipal Hospital, HMHC:Helinan Municipal Health Center, AMHC:Anjo Municipal Health Center, NNHC:Nagoya Nakamura Health Center, GHD:Gifu Health Department, M:males, and F:females.
* Two age-unknown are included.

Table 3. Abstinence Rates and Responses of Outpatients to Smoking Cessation as Percentages at the Two-month Survey

Facility	(N)	Quit	Intend to quit < 1 mo.	Intend to quit 1-6 mo.	Feel concern	No concern*	Non-respondents
ACCH: self-reported cancer patients							
Males	(201)	77.1	6.5	5.0	7.0	4.5	0.0
Females	(31)	58.1	12.9	16.1	6.5	6.5	0.0
Total	(232)	74.6	7.3	6.5	6.9	4.7	0.0
ACCH: non-cancer patients and non-responders							
Males	(554)	9.2	5.1	7.2	20.2	6.5	51.6
Females	(338)	4.1	3.0	6.8	23.1	5.9	57.4
Total	(892)	7.3	4.3	7.1	21.3	6.2	53.9
Hekinan Municipal Hospital							
Males	(181)	12.7	6.1	7.7	27.6	9.9	35.9
Females	(33)	6.1	0.0	3.0	21.2	3.0	66.7
Total	(214)	11.7	5.1	7.0	26.6	8.9	40.7
Examinees of four health checkup facilities							
Males	(1771)	3.0	5.0	10.4	41.6	16.7	23.3
Females	(424)	1.7	6.4	10.4	37.7	9.9	34.0
Total	(2195)	2.7	5.2	10.4	40.8	15.4	25.4

ACCH:Aichi Cancer Center Hospital
* "No concern" includes "no answer" in the questionnaire.

Cessation rate

When non-respondents were classified as non-cancer smokers, 77.1% (95% confidence intervals, 71.3-82.9%) of male self-reported cancer patients of ACCH answered at the two-month follow-up that they had quit smoking, as did 58.1% (40.7-75.5%) of female cancer patients. The difference in the abstinence rate between males and females was statistically significant ($p<0.05$). Among participants who reported without cancer and non-respondents combined, the abstinence rate was significantly higher ($p<0.01$) in males (9.2%, 6.8%-11.6%) than in females (4.1%, 2.0-6.2%), as shown in Table 3. Since the non-respondents possibly included unreported cancer patients and quitters, and were added to the denominator, the calculated rate was a conservative estimate of the two-month cessation rate. At the one-year follow-up, the cessation rate among the self-reported cancer patients had decreased to 54.2% (46.8-61.4%) for male smokers and 38.1% (23.6-54.4%) for female smokers, while the corresponding rate did not decrease for the other participants (Table 4).

In HMH, 25 out of 214 participants, 11.7% (7.4-16.0%), reported that they had quit smoking. The rate was higher in males than in females (Table 3), but not significantly because of the small number of female participants. One year after entry, the percentage was similar, though the response rate was decreased.

When the four health checkup facilities were combined, the abstinence rate for examinees was 2.7% (2.1-3.5%) out of 2,195 eligible participants. The rate was significantly lower ($p<0.001$) than that (8.1%) for non-cancer patients plus non-respondents in ACCH combined with all outpatients in HMH. The cessation rates according to age of examinees were as follows; in males, 1.8% (6/331) for those aged younger than 40 years, 2.9% (21/724) for those aged 40-59 years, and 3.6% (26/715) for those aged 60 years or over, and in females 3.4% (3/88), 1.4% (3/218), and 0.9% (1/117), respectively. At the one-year follow-up, 109 out of 1767 male smokers (6.2%, 5.1-7.4%) and 23 out of 423 female smokers (5.4%, 3.5-8.0%) answered to quit smoking.

Stage of abstinence preparation

For those who answered that they continued smoking, their intentions were questioned in the following manner, 1) no concern to quit, 2) feel concerned about smoking, but not intending to quit within 6 months, 3) intending to quit smoking within 6 months but not within 1 month, and 4) intending to quit smoking within 1 month. The responses are shown in Tables 3 and 4. The respondents who answered "no concern to quit" were less than 10% in ACCH and HMH. The percentage was higher among the examinees than the patients. In male examinees, it was 19.3% (64/331) for those aged younger than 40 years, 17.4% (126/724) for those aged 40 to 59 years, and 14.8% (106/715) for those aged 60 years or over, while in female examinees, 10.2% (9/88), 10.6% (23/218), and 12.0% (14/117), respectively.

Non-quitter respondents who had attempted to quit were 52.7% (50.0-55.4%) for males and 58.7% (52.9-64.5%) for females in the four health checkup facilities. The corresponding figure for the two hospitals was 63.5% (58.5-68.5%) and 71.7% (63.5-78.9%), respectively.

Multivariate analysis for predictors of smoking cessation

An unconditional logistic model was applied to smoking cessation at two-month follow-up. Facilities, sex, age and presence of disease were selected as predictors. Since data were not available for non-respondents, they were excluded

Table 4. Abstinence Rate and Responses of Outpatients to Smoking Cessation as Percentages at the One-year Survey

Facility	(N)	Quit	Intend to quit < 1 mo.	Intend to quit 1-6 mo.	Feel concern	No concern*	Non-respondents
ACCH: self-reported cancer patients							
Males	(190)	54.2	5.3	9.5	14.2	5.3	11.6
Females	(42)	38.1	2.4	14.3	26.2	7.1	11.9
Total	(232)	51.3	4.5	10.3	16.4	5.6	11.6
ACCH: non-cancer patients and non-responders							
Males	(510)	10.6	4.7	6.9	34.5	7.8	35.5
Females	(313)	9.9	4.5	10.5	24.9	4.5	45.7
Total	(823)	10.3	4.6	8.3	30.9	6.6	39.4
Hekinan Municipal Hospital							
Males	(181)	11.0	2.2	3.9	24.3	7.7	50.8
Females	(33)	3.0	9.1	0.0	21.2	6.1	60.6
Total	(214)	9.8	3.3	3.3	23.8	7.5	52.3
Examinees of four health checkup facilities							
Males	(1767)	6.2	3.0	9.2	36.4	10.5	34.8
Females	(423)	5.4	5.9	9.0	28.6	5.4	45.6
Total	(2190)	6.0	3.6	9.1	34.9	9.5	36.9

ACCH:Aichi Cancer Center Hospital
* "No concern" includes "no answer" in the questionnaire.

from the analysis. Subjects who answered that they had been cancer patients of ACCH were also excluded, since their cessation rate was quite different, resulting in 1,783 subjects for analysis. Cessation success was used as a dependent valuable.

Table 5 shows odds ratios and 95% confidence intervals obtained by the model. Hospital patients were found to have a 7.21 times significantly higher chance of success than health checkup examinees after adjustment for sex, age and presence of disease. Females were less likely to quit smoking than males, although this was not significant. Age and presence of disease were also not significant factors. Since the response rate at one-year follow-up decreased, multivariate analysis was not conducted for the cessation rate.

Table 5. Odd Ratios (OR) and 95% Confidence Intervals (95% CI) of Cessation at two-month Follow-up for all Participants Except Patients in ACCH and Non-Respondents

Factors		N	OR	95% CI
Facility	Health checkup	1656	1	
	Hospital	127	7.21	4.14-12.6
Sex	Male	1484	1	
	Females	299	0.76	0.37-1.55
Age	<40 years	325	1	
	40-59 years	729	1.29	0.66-2.55
	>60 years	728	1.49	0.73-3.04
Disease	Absent	1313	1	
	Present	470	1.54	0.94-2.52

Discussion

Hospital visits provide smokers with a good opportunity to consider smoking cessation. It has been reported that the majority of patients with serious diseases, such as myocardial infarction (Taylor et al., 1990, Ockene et al., 1992), quit smoking with or without cessation support. In studies of inpatients including those with less serious diseases conducted in the United States, a substantial proportion were reported to quit smoking; the one-year abstinence rate was 21% for a usual care group and 27% for an intervention group in one study (Miller et al., 1997), and in another study the figures were 21% and 31%, respectively (Taylor et al., 1996). Other investigations of inpatients in the United States revealed lower cessation rates; those after one year were 9% for those receiving usual care and 14% for those receiving smoking cessation intervention in one case (Stevens et al., 1993), and the six-months rates were 4.9% for the minimal care group and 9.7% for a counseling-plus-nicotine-patch group in another (Lewis et al.,1998). Smoking cessation rates for outpatients are similar to or lower than those reported for inpatients (Russell et al.,1979, Jamrozik et al., 1984), depending on the subjects' characteristics, and the circumstances in which the studies were conducted.

Although many cross-sectional studies on the prevalence of smoking have been conducted, there have been only a few follow-up studies reported for smokers visiting medical facilities in Japan. Hasuo et al (1998) reported that 47.1% of 68 patients with stomach cancer and 76.0% of 96 patients with oral, pharyngeal or laryngeal cancer, for whom no cessation programs were provided at their hospital, had quit smoking one year and a half after diagnosis. Another study

demonstrated that the one-year cessation rate of 839 health checkup male examinees was 10.1% for an intervention group and 4.4% for a control group (Higashi et al., 1998). The present study has been the largest follow-up study in Japan so far, in which smokers visiting a cancer hospital, a general hospital, or a health checkup facility were compared with the same design. The selected medical facilities were ordinal ones in Japan, meaning that the observed cessation rate could be applicable for the other facilities in the country.

Since informed consent is required for a follow-up study, some degree of selection of subjects is unavoidable. In this study, the refusal rate was highest in HMHC; about 38%. The refusers may have been smokers with no interest in quitting smoking. Accordingly, the cessation rate among smokers visiting each facility must be lower than that estimated here. On the contrary, the cessation rates among participants were slightly conservative estimates, because all non-respondents were regarded as non-quitters.

In the present study, self-reported data were used, and cessation was not confirmed biochemically. In this kind of large-scale follow-up study including smokers who may not fully cooperative, it is quite difficult to assess the cessation rate biochemically. Several studies demonstrated that self-reported cessation rate was higher than that confirmed biochemically (Miller et al., 1997, Taylor et al., 1996). The extent of overestimation by self-reporting may differ among studies, depending on the study situation. In the present case, abstinence was ascertained by a mailed questionnaire sent from and back to the Division of Epidemiology and Prevention, Aichi Cancer Center Research Institute, which was not related to participants'health care provision. Therefore, false responses concerning smoking status may have been minimal, though not evaluated.

Despite the limitations of the present study, the following findings were clear. The majority of cancer patients in ACCH quit smoking after diagnosis, but the rate was smaller in females than in males. At least 7.3% of outpatients excluding self-reported cancer patients were found to have refrained from smoking two months after visiting ACCH, while this figure was 11.7% for outpatients in HMH. The average 8.1% for the outpatients was significantly higher than the average 2.7% for examinees in the four health checkup facilities. Multivariate logistic analysis yielded a 7.21 of odds ratio for outpatients'quitting. Males and the aged were found to have relatively higher cessation rates, which was also a common finding in other studies (Fiore et al., 1990). Those suffering from disease had a 1.54 of odds ratio (marginally significant). A more detailed analysis of the ACCH data has already been published (Hamajima et al., 1999).

Since relapses are very frequent in quitting smoking, the cessation rate at the two-month follow-up is usually higher than the rate at a longer follow-up (Fiore et al., 1994, Goto et al., 1994). We also observed this to be the case, except for health checkup examinees. The latter finding is quite unique, and needs to be examined further.

Comparisons among different facilities in the same study framework seem valid even when the cessation is not confirmed biologically. HMH and HMHC are located in the same city. The different cessation rates suggest that smokers visiting hospital are more sensitive than those undergoing health checkups. At least 11% of smoker outpatient subjects in the follow-up study were found to have quit smoking at the two-month survey. It seems that smoking cessation programs are more effective for those visiting hospitals. It may therefore be more appropriate to allocate budgets for cessation programs to hospitals than to health checkup facilities. In the United States, smoking cessation intervention and support have been integrated into primary health care practice for decades (The Smoking Cessation Clinical Practice Guideline Panel and Staff, 1996, Thompson et al., 1988, Thorndike et al., 1998). Such intervention and support should be widely provided also at hospitals in Japan.

Acknowledgments

This work was supported in part by a Grand-in-Aid for Health Sciences Research Grants (Research on Health Services: H10-Health-050) of Ministry of Health and Welfare, Japan. The authors are grateful to Ms. Hiroko Fujikura for her technical assistance.

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