

## A Cross-sectional Survey on Smoking Cessation Counseling for Primary Care

Takuya NAGATA<sup>1,2\*</sup>, Masato MATSUSHIMA<sup>2</sup>, Tomokazu TOMINAGA<sup>2,3,5</sup>, Takamasa WATANABE<sup>4,5</sup>, and Yasuki FUJINUMA<sup>5,6</sup>

<sup>1</sup>*Ougibashi Clinic, Nankatsu Kinikyo*

<sup>2</sup>*Division of Clinical Epidemiology, The Jikei University School of Medicine*

<sup>3</sup>*Musashi-Koganei Clinic, Japanese Health and Welfare Co-operative Federation*

<sup>4</sup>*Kita-adachi Seikyo Clinic, Tokyo Hokuto Health Co-operative*

<sup>5</sup>*Centre for Family Medicine Development, Japanese Health and Welfare Co-operative Federation*

<sup>6</sup>*Interprofessional Education Research Center, Graduate School of Nursing, Chiba University*

### ABSTRACT

**Introduction :** Whether primary physicians accurately estimate a patient's stage of change (SOC) regarding smoking cessation is unknown. This study investigated whether SOC's agree when perceived by patients and by physicians.

**Methods :** Self-administered questionnaires were given before clinic consultation to patients with a smoking-related chronic disease and to their primary-care physicians. The principal variables were self-reported SOC's from patients in an entrance survey, physician-estimated SOC's of patients, and whether the physician recommended treatment for smoking cessation.

**Results :** Of 1260 eligible patients, 87 smokers with smoking-related chronic disease and their physicians were analyzed. The agreement between the patients and the physicians in SOC perception was poor (weighted  $\kappa$  coefficient : 0.21 ; 95% confidence interval : 0.03-0.39). The proportion of patients for whom the SOC had been underestimated by primary physicians increased with the Tobacco Dependence Screener score (odds ratio, 1.26 ; 95% confidence interval : 1.03-1.54). The physician-estimated SOC and the percentage of patients to whom smoking-cessation treatment had been recommended showed no significant trend ( $P = 0.93$ ).

**Conclusions :** The SOC's perceived by patients and by their primary-care physicians were in poor agreement. Primary physicians might not be carrying out interventions that corresponds with the estimated SOBC. (Jikeikai Med J 2017 ; 64 : 23-30)

**Key words :** stage of change, smoking cessation, cross-sectional study

### INTRODUCTION

Of the cigarette smokers who regularly visit clinics, many have one or more primary-care smoking-related chronic diseases (PC-SRCDs). These PC-SRCDs include hypertension, diabetes, dyslipidemia, respiratory diseases (e.g., emphysema, chronic bronchitis, and bronchial asthma), and cardiovascular diseases (e.g., coronary artery dis-

ease and cerebrovascular disease). These chronic health problems are usually managed by primary physicians, who play important roles in smoking cessation<sup>1</sup> and should also, during routine consultation, more strongly offer strategies for disease prevention<sup>2</sup>.

For primary physicians to support smoking cessation, a reportedly effective strategy is the 5 A's approach (i.e., Ask about tobacco use, Advise to quit through clear person-

---

Received for publication, August 29, 2017

永田 拓也, 松島 雅人, 富永 智一, 渡邊 隆将, 藤沼 康樹

Mailing address : Takuya NAGATA, Ougibashi Clinic, Nankatsu Kinikyo, #102 Southflats, 4-7-10 Miyoshi, Koto-ku, Tokyo 135-0022, Japan

E-mail : taku8nagata@gmail.com

alized messages, Assess willingness to quit, Assist to quit, and Arrange follow-up and support)<sup>3</sup>. However, when using this approach, primary physicians might not mention smoking-related problems during every consultation<sup>4</sup>; therefore, a patient's stage of change (SOC)<sup>5</sup> regarding smoking is unlikely to be correctly assessed. A study of the accuracy of the SOC and the details of inaccurate estimation (overestimation/underestimation) by physicians<sup>6</sup> has found moderate agreement of the patients' motivation to stop smoking between a patients' self-report and a general practitioner's assessment. However, the study also found that the physician's assessment of the patient's SOC was likely biased towards a high degree of agreement, because general practitioners were able to obtain information about the SOC during consultation and also filled in their questionnaires about the information immediately after consultation (i.e., exit survey).

The SOC should not be underestimated by primary physicians, because doing so might reduce the chance that they provide effective smoking-cessation treatments, such as nicotine replacement therapy and motivational interviews<sup>7,8</sup>. However, factors that might cause the SOC to be underestimated have not been studied. In addition, no studies have assessed the quality of the 5 A's Assist step or investigated whether pharmacologic treatments for smoking cessation are being provided on the basis of SOC's estimated by primary physicians.

The aim of the present study was to compare SOC's between those perceived by patients and by primary physicians, by conducting a questionnaire survey immediately before a consultation (i.e., entrance survey) to avoid bias. We determined the proportion of patients whose SOC was underestimated by the primary physicians and the factors influencing that underestimation. Another aim was to examine the effect of primary physician-estimated SOC on the recommendation of treatments for smoking cessation. For a final aim, we evaluated patients with PC-SRCD to determine the prevalence of smoking and the status of counseling for smoking cessation.

## METHODS

### *Study design, setting, and participants*

This cross-sectional study included consenting patients who visited their primary physicians at 10 clinics be-

longing to the Japanese Health and Welfare Co-operative Federation Centre for Family Medicine Development in Tokyo, Saitama, and Kanagawa. Patients were excluded if they were younger than 20 years or had dementia, fever, or an acute symptomatic condition. A primary physician was defined as the physician who had been in charge of treatment in the last 3 months and had seen the patient at least 3 times. Surveys were conducted for 25 days from September 5 to December 27, 2011. The subjects were recruited consecutively on each survey day.

### *Procedures*

After providing the subjects with oral and written explanations of the goals and methods of the study, the researcher distributed consent forms and self-administered questionnaires. On the basis of the subjects' answers about tobacco use, smokers and nonsmokers were identified and given different self-administered questionnaires. The researcher orally explained to the patients that their responses to the questionnaire would not be seen by their primary physician. The patients answered the questionnaires in the waiting room before their consultation with a physician. Immediately after entering the consultation room, the patients gave the physician both an answered questionnaire in a sealed envelope and an unanswered questionnaire. At the start of the consultation, the physicians answered the questionnaire, such as estimated SOC, without asking the patient questions related to smoking. After the consultation, the researcher collected data from the patient's self-administered questionnaire, the questionnaire answered by the physician, and the patient's medical records.

## MEASURES

### *Measurements for patients*

The measured variables of patients were: 1) smoking status, including smoker versus nonsmoker, Brinkman index, experience of quitting, and the level of nicotine dependence as determined with the Tobacco Dependence Screener (TDS)<sup>9</sup>; 2) patients' self-reported SOC about their state of readiness to quit smoking (precontemplation, contemplation, or preparation stage)<sup>5</sup>; 3) whether the patient had been recommended treatment for smoking cessation by the primary physician; 4) the frequency of smoking-related problems being brought up during consultation (5-step Lik-

ert scale) ; and 5) other adjusting factors, such as age, sex, and type of disease.

#### *Measurements for physicians*

The measured variables of physicians were : 1) estimated SOC of the patient ; 2) whether treatment for smoking cessation had been recommended during consultation ; 3) the frequency of smoking-related problems being brought up during consultation (5-step Likert scale) ; and 4) other adjusting factors, such as sex, length of time as a physician, and length of time as a patient's primary physician.

#### *About treatment for smoking cessation in an outpatient clinic in Japan*

Health insurance-based treatment for smoking cessation, which included the use of varenicline or nicotine patches, were provided for patients on the basis of the following criteria : 1) nicotine dependence (TDS score  $\geq 5$ ), 2) Brinkman index  $\geq 200$ , 3) a wish to quit smoking, and 4) written consent to receive treatment for smoking cessation.

#### *Statistical analysis*

As a source for the sex- and age-adjusted prevalence of smoking in Japan, data from the 2011 National Health and Nutrition Survey published by the Ministry of Health, Labour and Welfare<sup>10</sup> was used. We performed the Wilcoxon signed-rank test to compare SOC assessments between patients and primary physicians and used the weighted  $\kappa$  coefficient to evaluate the agreement between the groups<sup>11</sup>. The weights of the kappa coefficient were calculated by  $1 - \{(i-j)/2\}^2$ , in which the  $i$  and  $j$  indices represent the rows and columns, respectively, of the ratings by the patients and primary physicians<sup>11</sup>.

Logistic regression analysis was performed to explore the factors influencing underestimation of the SOC by the primary physician (objective variable). The explanatory variables included the patients' sex, age, and nicotine dependence ; the length of time being each patient's primary physician ; and the frequency of bringing up smoking-related problems during consultation. The nonparametric test developed by Cuzick<sup>12</sup> for trend across ordered groups (nonparametric trend test) was performed to evaluate the relationship between physician-estimated SOC and whether the physician had advised treatment for smoking cessation during the consultation. Patients or physicians with

missing values were excluded from the analyses. All statistical analyses were performed with the program STATA/SE release 11 (StataCorp LP, College Station, TX, USA). Differences with  $P < 0.05$  were considered statistically significant.

#### *Ethics approval and consent to participate*

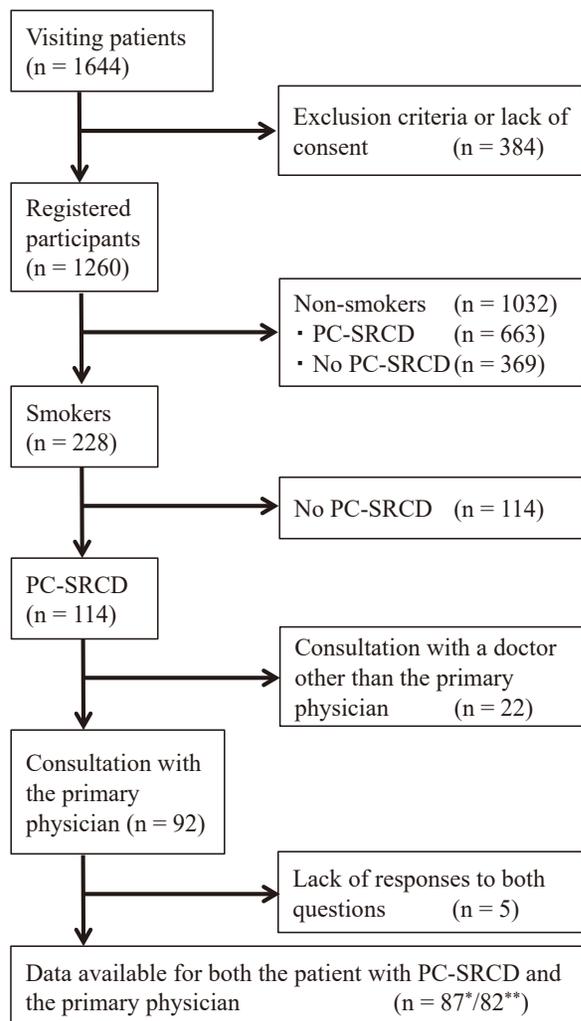
Before consultation, the patients provided written informed consent after receiving written explanations about the purposes of the survey, methods, protection of privacy ; that they would not be disadvantaged if they did not consent to participate in the study ; and that they could withdraw any time after providing consent. The study protocol was submitted to and approved by the ethics committee of Uji Coop Hospital (Tokyo).

## RESULTS

After 384 of the 1644 patients had been excluded from the study because of exclusion criteria or lack of consent, 1260 patients were registered as subjects (Fig. 1). Of these subjects, 228 were smokers, 114 of whom had PC-SRCD. Of these 114 patients, 92 consulted a primary physician. Self-administered SOC questionnaires were answered by 87 of these patients and their primary physician, but TDS data from 5 patients was incomplete. Therefore, only 82 patients were included in the logistic regression analysis.

Among the 1260 subjects, the crude prevalence of smoking was 18.1% (mean age,  $66.1 \pm 14.7$  years ; 43.8% were men). Furthermore, of the 777 patients who had PC-SRCD (mean age,  $70.6 \pm 10.6$  years ; 44.4% were men), 114 (14.7%) were smokers. The age- and sex-adjusted prevalence of smoking (standard population : Japanese general population in 2011) among smokers with PC-SRCD was 21.2%, which was almost the same as that of the general population (20.1%). Among the 114 smokers who had PC-SRCD, the mean age was  $64.1 \pm 10.8$  years ; 78.1% were men ; and the SOC stage they were at was precontemplation in 64.9%, contemplation in 19.3%, and preparation in 14.0% (Table 1).

The 25 primary physicians included 19 men (76.0%), had been a physician for a mean time of  $15.1 \pm 11.2$  years, and had been consulted by patients who had PC-SRCD for a mean time of  $25.6 \pm 2.3$  months. Smoking-related problems were never brought up during consultations by 18.4%



PC-SRCD = primary care smoking-related chronic disease

\*Survey on the stages of behavioral change

\*\*Survey on the predictors of underestimation of stage of behavioral change

Fig. 1. Flow of participant inclusion.

The selection process and number of participants are shown.

of physicians and were brought up every time by only 3.4% of them. Treatment for smoking cessation was recommended to smokers with PC-SRCD by only 51.7% of primary physicians. Smoking-cessation treatment had never been recommended to 28 of 57 smokers with PC-SRCD (49.1%) who were in the self-reported SOC precontemplation stage, to 8 of 20 (40.0%) in the contemplation stage, and to 6 of 10 (60.0%) in the preparation stage.

The assessment of SOC ( $P < 0.01$ ) differed greatly between patients and primary physicians, with underestima-

tion (26.4%) occurring more frequently than overestimation (6.9%). The SOC, according to the patients' self-reported answers, was underestimated by primary physicians in 90% of the patients in the preparation stage (Table 2). The agreement between patient-reported and primary physician-estimated SOCs was poor, with a weighted  $\kappa$  coefficient of only 0.21 (95% confidence interval: 0.03-0.39; Table 2).

Logistic regression analysis revealed that the proportion of SOC underestimation by the physician increased with the TDS score (odds ratio, 1.26; 95% confidence interval: 1.03-1.54; Table 3). Treatment for smoking cessation was never recommended by primary physicians to 36 of 73 patients (49.3%) in the physician-estimated precontemplation stage, to 4 of 11 patients (36.4%) in the contemplation stage, and to 2 of 3 patients (66.7%) in the preparation stage. The physician-estimated SOC and the percentage of patients to whom smoking-cessation treatment had been recommended showed no significant trend ( $P = 0.93$ ).

## DISCUSSION

The present study observed a significant discrepancy in the perception of SOC with regard to smoking cessation between patients and primary physicians. Primary physicians more often underestimated, rather than overestimated, the SOC for each patient and underestimated to a greater degree when nicotine dependence was greater. Furthermore, no significant trend was found between the primary physician's estimated SOC and the recommendation of smoking-cessation treatment. Unexpectedly, the age- and sex-adjusted prevalence of smoking in patients with PC-SRCD (21.2%) was similar to that of the general population. Only 3.4% of physicians brought up smoking-related problems during each consultation, and 48.3% never recommended smoking-cessation treatment. Furthermore, physicians had never recommended smoking-cessation treatment to 60% of smokers who had PC-SRCD and were in the preparation stage of self-reported SOC.

Similar studies have compared smoking-cessation counseling between physicians and patients, but some had inaccurate results because patients were surveyed long after they had consulted a physician<sup>13-15</sup>. In the present study, self-administered questionnaires were collected at similar

Table 1. Characteristics of patients with primary-care smoking-related chronic diseases

	Total ( <i>n</i> = 777)	Current smokers ( <i>n</i> = 114)	Survey on SOC <sup>†</sup> ( <i>n</i> = 87)	Survey on predictors of SOC underestimation ( <i>n</i> = 82)
Age in years, mean (SD)	70.6 (10.6)	64.1 (10.8)	64.6 (10.3%)	65.4 (10.1)
Male sex	345 (44.4%)	89 (78.1%)	68 (78.2%)	64 (78.0%)
Smoking	114 (14.7%)	114 (100%)	87 (100%)	82 (100%)
Diabetes mellitus	165 (21.2%)	30 (26.3%)	26 (29.9%)	24 (29.3%)
Hypertension	551 (70.9%)	83 (72.8%)	67 (77.0%)	62 (75.6%)
Dyslipidemia	336 (43.2%)	36 (31.6%)	26 (29.9%)	24 (29.3%)
Respiratory diseases	77 (9.9%)	12 (10.5%)	10 (11.5%)	10 (12.2%)
Cardiovascular disease	84 (10.8%)	10 (8.8%)	9 (10.3%)	9 (11.0%)
Tobacco Dependence Screener, mean (SD)	–	4.8 (2.8)	4.8 (2.9)	4.8 (2.9)
Brinkman index, mean (SD)	–	665.8 (394.8)	676.6 (404.8)	703.6 (386.2)
No experience in smoking cessation	–	65 (57.0%)	47 (54.0%)	43 (52.4)
SOC				
Precontemplation	–	74 (64.9%)	57 (65.5%)	54 (65.9%)
Contemplation	–	22 (19.3%)	20 (23.0%)	18 (22.0%)
Preparation	–	16 (14.0%)	10 (11.5%)	10 (12.2%)

<sup>†</sup>SOC = Stage of change ; SD = standard deviation.

Table 2. Stages of changes

		Primary physician-estimated stage of change			
		Precontemplation	Contemplation	Preparation	Total
Patients' self-reported stage of change	Precontemplation	52	4	1	57
	Contemplation	14	5	1	20
	Preparation	7	2	1	10
Total		73	11	3	87

Table 3. Predictors of underestimation of stages of change in patients

	Odds ratio (95% confidence interval)	<i>P</i> value
Age in years	1.01 (0.95-1.06)	N.S.
Sex (men = 1, women = 0)	0.37 (0.11-1.29)	N.S.
Tobacco Dependence Screener score	1.26 (1.03-1.54)	0.025
Frequency of bringing up smoking-related problems	0.98 (0.60-1.59)	N.S.
Time (months) as a primary-care physician	1.01 (0.98-1.03)	N.S.

N.S. = not significant

times from primary physicians and patients to eliminate possible differences in perception. Because audiotape or video could not be used, despite being the gold standard for assessing interventions for smoking problems by primary physicians, exit surveys have been used to assess patients and physicians<sup>6,16,17</sup>. However, in the present study, exit surveys were not used because of the variables we intended to

measure. Instead, entrance surveys were used to avoid affecting consultations after the purpose of the study had been explained to participants. To minimize bias, the patients were informed before answering that their answers would not be disclosed to physicians ; after being answered, the patients' questionnaires were enclosed in an envelope and collected by researchers not involved in the consultation.

The discrepancy between physicians and patients in SOC perception might be explained by several reasons. First, physicians might not have had enough time during consultation to bring up smoking. According to the Organization for Economic Co-operation and Development, consultations are performed more frequently in Japan than in other countries<sup>18</sup> despite Japan having fewer physicians<sup>19</sup>. Therefore, each consultation might have focused on managing coexisting conditions. A second possible reason is that if a patient continued to smoke despite having a chronic disease, a physician might assume a lack of interest in smoking cessation and underestimate the patient's SOC. On the other hand, a third possible reason is that patients might have exaggerated their SOC, as has been shown by earlier studies<sup>16,17</sup>. A fourth possible reason is that exposure to societal and environmental factors (e.g., public health messages, policy changes, marketing messages on smoking cessation, and advice from family members) might make smokers with PC-SRCD more ready to quit<sup>20</sup>. A possible solution to the discrepancy in SOC perception between physicians and patients is the use before consultation of a self-administered questionnaire about the readiness to quit smoking.

Our finding of a significant association between the TDS and the patient's SOC being underestimated by the primary physician might be explained by nicotine dependence being an important factor in determining the success or failure of quitting smoking<sup>21</sup>. A primary physician who suspected the patient to be strongly dependent on nicotine might have assumed that the patient was unable to quit or was not interested in quitting, even if assisted.

The absence of a significant trend between primary physician-estimated SOC and recommendations on smoking-cessation treatment in the present study suggests two possibilities. The first is that primary physicians were not performing treatments corresponding to their estimated SOC. The second possibility is that primary physicians were not active in smoking-cessation treatment or did not recognize it. However, this second possibility is unlikely because the percentage of smokers with PC-SRCD (51.7%) to whom smoking-cessation treatment was recommended by primary physicians in the present study was not lower than percentages in previous studies<sup>4,22</sup>. Another reason this possibility is unlikely is that the present study was conducted at family-practice education clinics, which teach patients about prevention and health promotion.

The absence of a significant trend between primary physician-estimated SOC and recommendations on smoking-cessation treatments suggests a gap between guidelines and practice, because Japanese guidelines for smoking-cessation treatment recommend the use of an SOC model<sup>23</sup>. Like the physician-patient discrepancy in SOC perception, this gap might be explained by the short consultation time, because, as described in the Methods, smoking status must be further assessed for health insurance-based treatment for smoking cessation. A system should be developed to allow longer consultation for smokers with PC-SRCD.

We had expected that the age- and sex-adjusted prevalence of smoking in patients with PC-SRCD would be lower than that in the general population; however, the prevalence was unexpectedly similar. A possible reason for this similarity is that participants' socioeconomic status, such as income, occupation, and academic background, might be related to the high smoking prevalence of patients with PC-SRCD, because socioeconomic status has been reported to affect smoking prevalence and smoking cessation<sup>24-26</sup>. Unfortunately, for the present study we did not have information about the participants' socioeconomic status. Another possible reason for the similarity of prevalence is that the primary physicians of the present study were not able to properly support smoking cessation for patients with PC-SRCD. During consultations in the present study, smoking-related problems or recommending smoking-cessation treatment was rarely brought up. For patients with PC-SRCD in the Japanese primary care setting, further assessment and appropriate treatments are needed.

The present study has several limitations. We did not use video or audiotapes, which are gold standards for assessing consultations; therefore, the data we obtained might not have been the true components of smoking-cessation treatment. Furthermore, sampling might have been biased because all subjects were patients who had visited urban primary-care clinics on days that had been randomly selected by the researchers. Nevertheless, surveys were performed on Mondays through Fridays, and subjects were consecutively recruited throughout each day. We believe this study design might have minimized the potential for sampling bias.

The present study found that the SOC poorly agreed between that estimated by primary physicians and that re-

ported by patients with PC-SRCD. Primary physicians more often underestimated than overestimated the SOC, significantly in association with the TDS. Moreover, the primary physicians might not have performed treatments corresponding with the estimated SOC. Treatments for smoking cessation were not recommended to more than half of patients in the preparation stage; these results suggest that smoking cessation is insufficiently supported during routine primary-care consultation, from the perception of the Assess and Assist steps of the 5 A's approach.

### CONFLICTS OF INTEREST

MM received lecture and the corresponding travel fees from the Centre for Family Medicine Development (CFMD) of the Japanese Health and Welfare Co-operative Federation, is an adviser of the CFMD practice-based research network, and is a program director of The Jikei Clinical Research Program for Primary-care. A daughter of MM was employed by Novo Nordisk Pharma Ltd., from April 1 to July 31, 2014. TN, TT, and TW were former residents in family medicine of the CFMD. TN was a member of the CFMD practice-based research network. TT, TW, and YF are members of the CFMD practice-based research network. TN, TT, and TW were former trainees of The Jikei Clinical Research Program for Primary-care. YF received lecture and the corresponding travel fees from The Jikei University School of Medicine. YF is a lecturer of The Jikei Clinical Research Program for Primary-care.

To our knowledge, there are no other potential conflicts of interest relevant to this work. This work was supported by a research grant for the fiscal year 2012 from The Jikei University School of Medicine and Postgraduate Medical School.

*Acknowledgements* : We acknowledge all the patients who participated in our study. We would like to thank The Jikei Clinical Research Program for Primary-care for its advice on study design and the Japanese Health and Welfare Co-operative Federation Centre for Family Medicine Development for its collaboration in the implementation of the research.

### MEETING PRESENTATIONS

Preliminary data from this manuscript were presented at the 3rd Annual Conference of the Japan Primary Care Association, held in Fukuoka, Japan, in September 2012, and at the 4th Annual Conference of the Japan Primary Care Association, held in Fukuoka, Japan, in May 2013.

### REFERENCES

1. Stead LF, Buitrago D, Preciado N, Sanchez G, Hartmann-Boyce J, Lancaster T. Physician advice for smoking cessation. *Cochrane Database Syst. Rev.* 2013 May 31 ; (5) : CD000165. <https://doi.org/10.1002/14651858.CD000165.pub4>. [accessed 2017-08-23]
2. Lelong H, Casadevall M, Haus F, Levezouet CA, Regnier C, Durel B, et al. [Assessment of preventive practices in primary care occurring in hospital]. *Rev Epidemiol Sante Publique.* 2011 ; 59(2) : 107-13. French.
3. U.S. Preventive Services Task Force. Counseling and interventions to prevent tobacco use and tobacco-caused disease in adults and pregnant women : U.S. Preventive Services Task Force reaffirmation recommendation statement. *Ann Intern Med.* 2009 ; 150(8) : 551-5.
4. Ellerbeck EF, Choi WS, McCarter K, Jolicoeur DG, Greiner A, Ahluwalia JS. Impact of patient characteristics on physician's smoking cessation strategies. *Prev Med.* 2003 ; 36(4) : 464-70.
5. Prochaska JO, Velicer WF. The transtheoretical model of health behavior change. *Am J Health Promot.* 1997 ; 12(1) : 38-48.
6. Verheijden MW, Bakx JC, Delemarre IC, Wanders AJ, van Woudenberg NM, Bottema BJ, et al. GPs' assessment of patients' readiness to change diet, activity and smoking. *Br J Gen Pract.* 2005 ; 55(515) : 452-7.
7. Stead LF, Perera R, Bullen C, Mant D, Hartmann-Boyce J, Cahill K, et al. Nicotine replacement therapy for smoking cessation. *Cochrane Database Syst. Rev.* 2012 Nov 14 ; 11 : CD000146. <https://doi.org/10.1002/14651858.CD000146.pub4>. [accessed 2017-08-23]
8. Lindson-Hawley N, Thompson TP, Begh R. Motivational interviewing for smoking cessation. *Cochrane Database Syst. Rev.* 2015 Mar 2 ; (3) : CD006936. <https://doi.org/10.1002/14651858.CD006936.pub3>. [accessed 2017-08-23]
9. Kawakami N, Takatsuka N, Inaba S, Shimizu H. Development of a screening questionnaire for tobacco/nicotine dependence according to ICD-10, DSM-III-R, and DSM-IV. *Addict Behav.* 1999 ; 24(2) : 155-66.
10. Cancer Control and Health Promotion Division Health Service Bureau Ministry of Health, Labour and Welfare, Japan. [Heisei 23nen kokumin kenko eiyo chousa houkoku] (The National Health and Nutrition Survey in Japan, 2011). <http://www.mhlw.go.jp/bunya/kenkou/eiyoudl/h23-houkoku.pdf>. [accessed

- 2017-12-20]
11. StataCorp. 2009. Stata 11 Base Reference Manual. College Station, TX : Stata Press.
  12. Cuzick J. A Wilcoxon-type test for trend. *Stat Med.* 1985 ; 4(1) : 87-90.
  13. Conroy MB, Majchrzak NE, Regan S, Silverman CB, Schneider LI, Rigotti NA. The association between patient-reported receipt of tobacco intervention at a primary care visit and smokers' satisfaction with their health care. *Nicotine Tob Res.* 2005 ; 7 Suppl 1 : S29-34.
  14. Nicholson JM, Hennrikus DJ, Lando HA, McCarty MC, Vessey J. Patient recall versus physician documentation in report of smoking cessation counselling performed in the inpatient setting. *Tob Control.* 2000 ; 9(4) : 382-8.
  15. Ward J, Sanson-Fisher R. Accuracy of patient recall of opportunistic smoking cessation advice in general practice. *Tob Control.* 1996 ; 5(2) : 110-3.
  16. Pbert L, Adams A, Quirk M, Hebert JR, Ockene JK, Luippold RS. The patient exit interview as an assessment of physician-delivered smoking intervention : a validation study. *Health Psychol.* 1999 ; 18(2) : 183-8.
  17. Wilson A, McDonald P. Comparison of patient questionnaire, medical record, and audio tape in assessment of health promotion in general practice consultations. *BMJ.* 1994 ; 309(6967) : 1483-5.
  18. OECD (2015). Doctors' consultations (indicator). <http://dx.doi.org/10.1787/173dcf26-en>. [accessed 2017-08-23]
  19. OECD (2014). Doctors (indicator). <http://dx.doi.org/10.1787/4355e1ec-en>. [accessed 2017-08-23]
  20. The 2008 PHS Guideline Update Panel, Liaisons, and Staff. *Treating Tobacco Use and Dependence : 2008 Update. Clinical Practice Guideline.* Rockville, MD : U.S. Department of Health and Human Services, Public Health Service ; 2008.
  21. Vangeli E, Stapleton J, Smit ES, Borland R, West R. Predictors of attempts to stop smoking and their success in adult general population samples : a systematic review. *Addiction.* 2011 ; 106(12) : 2110-21.
  22. Frank E, Winkleby MA, Altman DG, Rockhill B, Fortmann SP. Predictors of physician's smoking cessation advice. *JAMA.* 1991 Dec 11 ; 266(22) : 3139-44.
  23. JCS Joint Working Group ; Japanese Society for Oral Health ; Japanese Society of Oral and Maxillofacial Surgeons ; Japanese Society of Public Health ; Japanese Respiratory Society ; Japan Society of Obstetrics and Gynecology ; Japanese Circulation Society ; Japan Pediatric Society ; Japanese College of Cardiology ; Japan Lung Cancer Society. Guidelines for Smoking Cessation (JCS 2010)—digest version. *Circ J.* 2012 ; 76(4) : 1024-43.
  24. Hiscock R, Bauld L, Amos A, Fidler JA, Munafò M : Socioeconomic status and smoking : a review. *Ann N Y Acad Sci* 2012 ; 1248 : 107-23.
  25. Fukuda Y, Nakamura K, Takano T : Socioeconomic pattern of smoking in Japan : income inequality and gender and age differences. *Ann Epidemiol.* 2005 ; 15(5) : 365-72.
  26. Hu L, Sekine M, Gaina A, Nasermoaddeli A, Kagamimori S : Association of smoking behavior and socio-demographic factors, work, lifestyle and mental health of Japanese civil servants. *J Occup Health.* 2007 ; 49(6) : 443-52.