



Improving smoking cessation outcomes in secondary care: Predictors of hospital staff willingness to provide smoking cessation referral

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ABSTRACT

Since implementation of the New Smoking Cessation Policy in Taiwan, more patients are attending smoking cessation clinics. Many of these patients were referred by hospital staff. Thus, factors which influence the hospital staff's willingness to refer are important. In this study, we aim to understand the relation between smoking cessation knowledge and willingness for referral.

A cross-sectional study using a questionnaire was conducted with staff of a community hospital during the year 2012–2013. Willingness to provide smoking cessation referral and relevant correlated variables including demographic data, knowledge of basic cigarette harm, and knowledge of resources and methods regarding smoking cessation were measured.

A total of 848 of 1500 hospital staff returned the questionnaire: 249 physicians (29.4%), 402 nursing staff (47.4%), and 197 administration staff (23.2%). 790 (93.2%) staff members have never smoked, 19 (2.2%) had quit smoking, and 39 (4.6%) still smoke. 792 (93.4%) members had interest in receiving smoking cessation education. The mean total score (highest potential score of 6) of basic cigarette harm knowledge was 4.56 (± 1.25). The mean total score (highest potential score of 7) of resources and methods about smoking cessation was 4.79 (± 1.35). The significant variable correlated with willingness to refer was total score of resources and methods about smoking cessation.

Hospital staff who knew more about resources and methods about smoking cessation were more willing to refer smoking patients to the smoking cessation service. Thus, continuing medical education for hospital staff should include resources and methods about smoking cessation to promote smoking cessation.

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1. Introduction

Quitting smoking at any age affords significant health benefits in secondary care organizations, such as fewer complications and shorter hospital stays (Cataldo et al., 2010). People who stop smoking after diagnosis of early stage lung cancer also have better prognostic outcomes than the patient who continues smoking (Parsons et al., 2010). Thus, health professionals working in a hospital setting have the responsibility to promote healthy behavior among patients in their organization. Due to the above reasons, promoting smoking cessation is of paramount importance to secondary care.

Tobacco control is also an important issue in Taiwan. The tobacco health and welfare tax was instituted by the Taiwanese government in 2002. Funds from the tax were used to initiate and maintain several smoking cessation outpatient programs (Chang et al., 2010). Although doctors had some financial incentives to provide medication (either nicotine replacement therapy or varenicline) and brief cessation consulting during routine outpatient visits, patients attempting to quit smoking had to pay 550–1250 NTD (New Taiwan dollars) (approx. US\$18–42) every week for medication. Due to these out of pocket costs, the smoking cessation rate remained unsatisfactory. In order to encourage more smokers to use the smoking cessation service, the Taiwanese government implemented the New Smoking Cessation Policy in March 2012. In the new policy, (i) all outpatients and inpatients can use the smoking cessation clinic service (ii) patients pay no more than 200 NTD (US\$6.6), per week for two 8 week courses each year. As a result, the number of smokers using the smoking cessation service from March 2012 to February 2013 increased by 39.2% compared to March 2011 to

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February 2012. The 6-month point abstinence rate during March 2012 to May 2013 was 30.3%, while it was only 23.9% during the decade of February 2002 to February 2012.

In Taiwan, many smokers have health problems, and they have been referred to smoking cessation service during admission or routine clinics by hospital staff, including physicians, nurses and administration staff (Chou et al., 2013; Li et al., 2014). However, few studies have elucidated factors that affect the likelihood of referral. This lack of knowledge poses challenges to any health care institution. It is necessary to understand the influential factors. In this study, we aim to explore the barriers and the variables related to hospital staff willingness to provide smoking cessation referrals so that we can contribute to the development of smoking cessation service.

2. Methods

2.1. Design

This study represents a cross-sectional questionnaire survey of 1500 employees at a 850 beds community hospital in New Taipei City, Taiwan. Paper surveys were given to each department then distributed to the staff during the period of December 2012 to February 2013. The data was analyzed in 2014. Informed consent was implied by the return of the questionnaire. All study procedures were approved by the ethical committee of the hospital.

2.2. Participants

The target population was the entire staff of the community hospital. The survey period was from December 2012 to February 2013. The staff included physicians, nurses and administrators.

2.3. Instrument

A questionnaire with four parts was administered to all participants. Questions on staff demographic characteristics, knowledge of basic cigarette harm and smoking cessation, knowledge of resources and methods about smoking cessation, and willingness to provide smoking cessation referral were included. The questionnaire was designed after careful scrutiny of the literature by a group of experts.

Variable included category of work, smoking status. We also asked about previous participation of smoking awareness activities. These events are usually held in or around the hospital including free exhaled carbon monoxide sampling, free lung function testing, etc. that raise general awareness about the harmful effects of smoking. We also asked whether the staff have interest in receiving more education about smoking cessation. Smoking cessation education for hospital staff included consulting training, review of available medications and pharmacology, and an overview of available resources for patient referral. The other 3 sections are described below.

1. Knowledge of basic cigarette harm

Knowledge of basic cigarette harm was measured with six items. All items were based on the clinical experience of investigators and literature review (Peters et al., 2013; Freedman et al., 2008; Asomaning et al., 2008; Hurt, 2009). The section contained 6 items, and was scored as true = 1 and false/unknown = 0 for each item with highest potential score of 6.

2. Resources and methods about smoking cessation

Seven survey items were included to measure knowledge regarding methods and resources about smoking cessation. These items were

decided by journal review (Tillgren et al., 1996; Broms et al., 2004; Perkins et al., 2011) and experts' practical experience. The section included 7 items, and was scored as true = 1 and false/unknown = 0 for each item with highest potential score of 7.

3. Willingness to provide smoking cessation referral

This section examined staff willingness to provide patients with smoking cessation referral. Willingness was graded using yes = 1 and no = 0.

2.4. Statistical analysis

Data management and statistical analyses were calculated by SPSS 11.0 statistical software. Frequency distributions were used to describe the demographic data and the distribution of each variable. Mean values and standard deviations (SDs) were measured to analyze the association of each variable with occupation, smoking status, interesting in receiving smoking cessation education, knowledge of basic cigarette harm, knowledge of resources and methods regarding smoking cessation, and willingness to provide smoking cessation referral. Logistic regression analysis determined the relative values of the variables related to willingness to provide smoking cessation referral. A value of $p < 0.05$ was considered statistically significant.

3. Results

3.1. Study participant characteristics

Questionnaires were given to all hospital staff a total of 1500 people. And complete information was collected from 848 people for a response rate of 56.5%. There were 249 physicians (29.4%), 402 nursing staff (47.4%), and 197 administration staff (23.2%). Seven hundred and ninety (93.2%) staff members had never smoked, 19 (2.2%) had quit smoking, and 39 (4.6%) still smoked at that time. Of the 848 staff, 114 (13.4%) had ever joined a smoking cessation awareness activity. Seven hundred twenty-nine staff (93.4%) had interest in receiving smoking cessation education in the future. Seven hundred ninety-six (93.9%) staff had a supportive attitude toward creating a smoking free hospital, defined as having an indoor non-smoking policy with smoking cessation clinic available for anyone interested. 699 (82.4%) staff members thought that

Table 1
Variables related to the willingness of referral.

Variables	n	%
Occupation		
Physician	249	29.4
Nursing staff	402	47.4
Administration staff	197	23.2
Smoking status		
Yes	39	4.6
Quit	19	2.2
Never	790	93.2
Ever joined smoking cessation awareness activity		
Yes	114	13.4
No	734	86.6
Interest in receiving smoking cessation education		
Yes	792	93.4
No	56	6.6
Attitude toward smoking free hospital		
Supportive	796	93.9
Not at all or fairly supportive	52	6.1
Attitude toward smoking cessation education		
Important	699	82.4
Not at all or fairly important	149	17.6
Variables	Mean (\pm SD)	Range
Total score of basic cigarette harm knowledge	4.56 (\pm 1.25)	0–6
Total score of resources and methods about smoking cessation	4.79 (\pm 1.35)	0–7

smoking cessation education was important. The mean total score of basic cigarette harm knowledge was 4.56 (± 1.25) out of 6. The mean total score of resources and methods about smoking cessation was 4.79 (± 1.35) out of 7 (Table 1).

3.2. Basic knowledge of cigarette harm

Comparing basic knowledge of cigarette harm in willing to refer staff versus unwilling to refer staff is summarized in Table 2. The correct items in each group are expressed by number and percentage. Stratified analyses were performed on the basic knowledge of cigarette harm in willing to refer and unwilling to refer groups. There was no significant difference between referral willingness in staff who knew about nicotine effect, secondhand smoking harm and risk to infertility and those who did not. However, staff who knew the correct answer regarding dependence mechanism, addictive substances, and associated smoking disease were more willing to refer patients for smoking cessation assistance ($p < 0.05$).

3.3. Knowledge of resources and methods about smoking cessation

Table 3 shows the items surveyed and percentage of accurate responses regarding methods and resources of smoking cessation in willing to refer versus unwilling group. Knowing the correct answer about dependence mechanism, vitamin C decreasing nicotine craving, food choices during smoking cessation, supportive environment factors and exhaled CO detection methods did not affect the willingness to refer. Staff who knew light cigarettes as harmful as regular cigarettes and were more aware of outpatient and inpatient smoking cessation resources were more willing to refer (Table 3).

3.4. Significant variations in knowledge of survey items by type of hospital staff

Different hospital staff had significantly varied knowledge of survey items as shown in Fig. 1. Physicians and nursing staff had more correct knowledge of cigarette harm and methods about smoking cessation than did administration staff. For example, 190 physician (76.3%) and 310 nursing staff (77.1%) knew the dependence mechanism. However, only 114 administration staff (57.9%) understood the concept of dependence mechanism.

3.5. Important variables correlated with willingness of referral

Logistic regression analysis showed that willingness to refer is not affected by smoking status, occupation, interest in receiving smoking cessation education, and total basic cigarette harm score. The significant variable correlated with willingness of referral was total score of resources and methods about smoking cessation (odds ratio = 1.221, 95% confidence interval = 1.001–1.489) (Table 4).

4. Discussion

This is the first study to understand what factors affect hospital staff to provide smoking cessation referral in Taiwan. According to this study, having more knowledge of resources and methods about smoking cessation is the key factor for referral by staff in secondary care. Although smoking cessation is an important issue in Taiwan, not every health care staff member has received education about this topic. In order to improve current smoking cessation strategy, the continued education and training programs for health employees should include resources and methods regarding smoking cessation.

The Taiwanese government began implementing smoking cessation service programs in 2002. Only physicians, nurses and pharmacists who are certified by a smoking cessation training program can be reimbursed for their services. Guo et al. (2010) evaluated the training program as appropriate and effective. However, only health care professionals involved in smoking cessation attend the training program. Many hospital staff still lack correct information regarding smoking harm and smoking cessation. In this study, we emphasize that knowledge of basic smoking harm, and knowledge of methods and resources about smoking cessation does affect willingness to refer patients for smoking cessation. According to our results, staff who knew the correct answer regarding dependence mechanism, addictive substances, and associated smoking disease were more willing to refer. Staff who had correct conceptions about smoking cessation and were more aware of outpatient and inpatient smoking cessation resources were also more willing to refer for smoking cessation.

To promote smoking cessation, WHO and NICE guidelines recommend that all staff be trained to support smokers who seek secondary service to quit smoking (Tobacco Free Initiative, 2015; <https://www.nice.org.uk/guidance/ph48>, 2015). In fact, not all employees in secondary care institution are well trained. For instance, in our study, only 79.5% of physicians knew that cigarettes could cause infertility. Moreover, little more than half of staff members – only 60.2% of doctors, 65.4% of nurses and 52.3% of administration staff – knew about inpatient smoking cessation resources. If the hospital staff does not know about a particular service, how can patients be referred to it? Additional on-the-job training should increase likelihood of smoking cessation referral in a health care institution.

Physicians not only serve as role models for patients but also play a significant role as advisers who influence smoking cessation in patients. Despite this, physicians do not routinely discuss smoking cessation, as shown in a German study by Holmberg et al. (2014). Previous studies of physician related variables determined that the main barriers include: insufficiency of time to provide consult, limited perceived role, patients' inability to afford medication, lack of familiarity with a service, lack of education in smoking cessation skills, and the physician's smoking status (Panaitescu et al., 2014; Duaso et al., 2014). Their results show that a physician's smoking status may influence the offer of smoking cessation treatments to patients. Doctors who currently smoke are less likely to advise and counsel their patients to quit than non-smokers or ex-smokers. However, Duaso et al. (2014) also point

Table 2
Comparing basic knowledge of cigarette harm in willing to refer versus unwilling group of hospital staff.

Knowledge survey item	Correct answers among willing to refer group ^a		Correct answers among unwilling group ^b		p-Value [*]
	n	%	n	%	
1. Dependence mechanism [†]	568	73.5	56	61.3	0.025
2. Nicotine effect	653	84.5	60	80	0.312
3. Associated disease [†]	534	69.1	40	53.3	0.005
4. Addiction substances [†]	744	96.2	66	88	0.001
5. Secondhand smoke harm	595	77	51	68	0.082
6. Risk to infertility	619	80.1	56	74.7	0.267

^{*} The p-value was calculated using the chi-square test for the analysis between willing to refer and unwilling to refer group.

[†] Item with p-value < 0.05.

^a Willing to refer number = 773.

^b Unwilling to refer number = 75.

Table 3
Comparing knowledge of resources and methods about smoking cessation in willing to refer versus unwilling group of hospital staff.

Knowledge survey item	Correct answers among willing to refer group ^a		Correct answers among unwilling group ^b		p-Value*
	n	%	n	%	
1. Vitamin C decreases craving	457	59.1	38	50.7	0.156
2. Food choices during smoking cessation	309	40	28	37.3	0.655
3. Light cigarettes are equally harmful as regular cigarettes [†]	732	94.7	63	84	<0.001
4. Supporting environment factors	370	47.9	38	50.7	0.643
5. Exhaled CO detection methods	466	60.3	50	66.7	0.280
6. Outpatient clinics smoking cessation resources [†]	750	97.0	59	78.7	<0.001
7. Inpatient smoking cessation resources [†]	447	57.8	19	25.3	<0.001

* The p-value was calculated using the chi-square test for the analysis between willing to refer and unwilling to refer group.

[†] Item with p-value < 0.05.

^a Willing to refer number = 773.

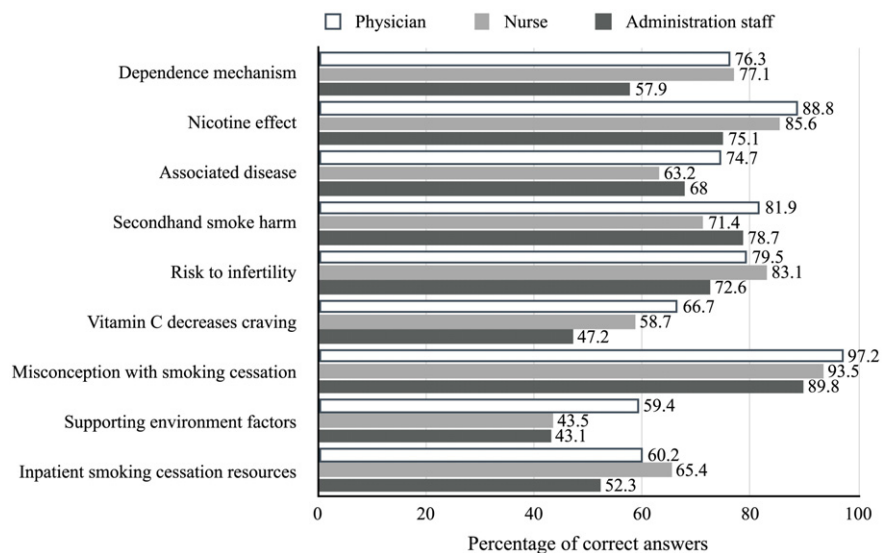
^b Unwilling to refer number = 75.

out that smoking physicians are more likely to refer patients to smoking cessation programs. Our study involved not only physicians, but also other hospital staff including nurse and administration. In contrast to previous literature, our results indicate that smoking status is not a significant factor correlated with willingness of referral. One reason for this may be that only 39 staff members (4.6%) out of 848 total smoke. Occupation, interest in receiving smoking cessation education, and total score of basic smoking harm knowledge were not factors either. The significant variable affecting willingness of referral was the total score of methods and resources smoking cessation. By knowing more about methods and resources of smoking cessation, the hospital staff will be more likely to provide smoking cessation referral for patients. The results of this study might provide a focus for training medical personnel in secondary care and stimulate discussion of smoking cessation knowledge to the effect of promoting quitting.

There are some limitations to this study. First, only one community hospital was included in this study. If several secondary care institutions were included, the result may be more comprehensive and reliable. Second, only 56.5% of the staff surveyed returned the completed questionnaires. Distributing the questionnaire to the staff in daily work setting might have reduced the response rate. Third, because this study was a cross-sectional survey, it is strongly suggested that to

devise a future follow-up study which could show the effects of education about smoking cessation.

WHO recommends that all health professionals, including physicians, dentists, pharmacists, nurses and others can be instrumental in helping smokers quit tobacco use (Tobacco Free Initiative, 2015). Tobacco control should be involved in continued education and training programs for health employees (Tobacco Free Initiative, 2015). NICE guidelines also mentioned that it is necessary to ensure that staff are trained to support smokers in quitting smoking while seeking secondary care service (<https://www.nice.org.uk/guidance/ph48>, 2015). WHO and NICE both agree that education for health care professionals regarding tobacco control is crucial for smoking cessation success. However, the content of these education programs is not specified in the guidelines. According to our study, staff who are more knowledgeable about the methods of quitting and available smoking cessation programs for inpatients and outpatients are more willing to refer. Thus, guidelines for tobacco control may emphasize the importance of methods and resources about smoking cessation in the continued education and training programs to ensure that all the members of health care organizations are able to give smoker appropriate advice. This kind of survey should be adopted in other countries, and certain results could provide new insights for tobacco control and future focus for research.



*Regardless of position, staff members were all equally knowledgeable regarding the variables “Addiction substance”, “food choice during smoking cessation”, “outpatient smoking cessation resources”, and “exhaled CO detection methods”.

Fig. 1. Different hospital staff have significantly varied knowledge of survey items.

Table 4

The significant variables influencing the willingness of referral for smoking cessation.

Variables	OR	95% CI
Smoking status	1.424	0.523–3.877
Occupation	1.054	0.527–2.110
Wiling to receive smoking cessation education	0.546	0.252–1.185
Total score of basic cigarette harm knowledge	1.181	0.961–1.452
Total score of resources and methods about smoking cessation	1.221	1.001–1.489

OR, odds ratio; CI, confidence interval.

5. Conclusion

According to this study, hospital staff who knew more about methods and resources for smoking cessation were more willing to refer patients to the smoking cessation service. This finding could be useful for medical education of hospital staff to promote smoking cessation.

Conflict of interest statement

The authors declare that there are no conflicts of interest.

Acknowledgments

All authors had full access to all the data in the study and take responsibility for the integrity of the data analysis. Yin-Yu Chang and Hsien-Liang Huang designed data collection tools, monitored data collection for the whole study, wrote the statistical analysis plan, cleaned and analyzed the data, and drafted and revised the paper. Shu-Man Yu, Yun-Ju Lai, Ping-Lun Wu, and Kuo-Chin Huang designed data collection tools and cleaned and analyzed the data.

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