

Helping cancer patients to quit smoking by understanding their risk perception, behavior, and attitudes related to smoking

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Abstract

Background: Evidence shows that smoking is a major cause of cancer, and cancer patients who continue smoking are at greater risk for all causes of mortality, cancer recurrence, and second primary cancers. Nevertheless, many cancer patients still smoke and are not willing to quit. This study aimed at understanding the needs and concerns of current and ex-smoking cancer patients, including their risk perceptions, and the behavior and attitudes related to smoking.

Methods: A qualitative research was conducted in an oncology outpatient clinic. A one-to-one semi-structured interview was conducted with current Chinese smokers and ex-smokers after they had been diagnosed with cancer. Data saturation was achieved after interviewing a total of 20 current smokers and 20 ex-smokers.

Results: A total of 241 patients who were smokers prior to their diagnosis of cancer were identified. Of 241 patients, 208 (86.31%) quit and 33 (13.69%) continued smoking after receiving a cancer diagnosis. In general, patients who refused to quit smoking subsequent to a cancer diagnosis thought that the perceived barriers to quitting outweighed the perceived benefits of quitting. In contrast, most cancer patients who quit after their cancer diagnoses thought that the perceived benefits of quitting greatly outweighed the perceived barriers to quitting.

Conclusions: It is vital that healthcare professionals should help cancer patients to quit smoking. Understanding how current smokers and ex-smokers perceive the risks of smoking, and their behavior, attitudes, and experiences related to smoking is an essential prerequisite for the design of an effective smoking cessation intervention.

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Introduction

Smoking is associated with many types of cancer including cancer of the oral cavity, larynx, pharynx, lung, esophagus, stomach, pancreas, liver, kidney, ureter, bladder, uterine cervix, and leukemia [1,2]. Previous studies have indicated that current smokers have a twofold to threefold increased risk of cancer, and 90% of lung cancers are attributable to smoking [3,4].

Although advances in cancer screening and treatment efficacy have contributed to significant increases in survival rates [5], there is strong evidence that cancer patients who continue smoking are at greater risk for all causes of mortality, cancer recurrence, and second primary cancers [6]. They also have reduced survival duration [1,7]. Moreover, smoking can reduce the efficacy of clinical and medical treatments for cancer including radio- and chemo-therapies [8,9] and increase the risk of treatment-related side effects [10]. Furthermore, there is some evidence that quitting smoking after being diagnosed with cancer could reduce the risk of disease progression [11], ameliorate adverse treatment-related effects, and improve prognosis and quality of life [7].

Given the harmful effects of continued smoking and the beneficial effects of quitting smoking on cancer patients' physical and psychological well-being, there is an imperative need for healthcare professionals to help this vulnerable group to quit smoking [12].

Cancer patients present an excellent 'teachable moment' for smoking cessation interventions, as their current illness could largely be due to smoking [13]. However, many chronic patients are heavy smokers [14] with a long smoking history, high nicotine dependency, no quit attempt history, and no intention of quitting smoking. Despite substantial evidence that smoking causes cancer, there has been a lack of population-based studies on smoking prevalence among cancer patients. Some western studies have reported that about one-third of cancer patients do not stop smoking after diagnosis [6,15,16]. In a study to examine how lung cancer patients attribute the cause of their disease in Sweden, about 38% of participants did not know about the cause of their cancer, followed by nearly 32% of them thought that their cancer could be attributed to toxins/air pollution, and 18% of them said that psychological stress was the main cause of their cancer [17]. There is a need

to design special interventions that use strong warning to clearly communicate the risk (and extra risks) of continued smoking to this group. Before this can be achieved, it is necessary and important to fully understand the reasons that some people continue to smoke after being diagnosed with cancer, their risk perceptions about smoking, and the behavior, attitudes, and experiences related to smoking and smoking cessation [17].

Cancer is the number one killer in Hong Kong, causing nearly one-third of all deaths each year [18]. There are about 24,000 new cancer cases in Hong Kong each year [19]. Over the years, the Hong Kong government and community have put enormous efforts on raising tobacco tax, legislation, law enforcement, and health promotion and provision of smoking cessation services. The prevalence of daily cigarette smokers has been decreasing from 23.3% in 1982 to 10.7% in 2012, which is one of the lowest around the world [20]. Nevertheless, despite the lowest rate recorded since 1982, the remaining 645,000 daily smokers in Hong Kong cannot be overlooked or undervalued [20]. Although much attention has been focused on cancer treatment, the value in helping cancer patients quit smoking is often underestimated by healthcare professionals [21]. A review of the literature reveals that very few smoking cessation programs target this vulnerable group, and only very few oncology nurses help cancer patients to quit smoking [22]. This study aimed at understanding the needs and concerns of Chinese current and ex-smoking cancer patients, including their risk perceptions, and the behavior, attitudes, and experiences related to smoking and smoking cessation.

Methods

Design

A qualitative research design was used to study the behavior, attitudes, and experiences related to smoking and smoking cessation of current smokers and ex-smokers after they had been diagnosed with cancer. A purposive sample of 20 cancer patients who continued to smoke and 20 who quit smoking after their cancer diagnosis was recruited from September 2012 to January of 2013.

Participants

All eligible cancer patients attending medical follow-up procedures at one of the largest oncology outpatient clinics of a public acute-care hospital in Hong Kong were invited to participate in the study. The inclusion criteria were cancer patients who (a) had smoked weekly in the past 6 months or had quit smoking after the diagnosis of cancer; (b) had been diagnosed with cancer of the lung, liver, stomach, nasopharynx, or colorectal at least 6 months ago (so their conditions and treatments would be stable); (c) were patients in stages I, II, III, or IV;

(d) were 18 years old or older; and (e) could communicate in Cantonese. We excluded those with unstable medical conditions, as advised by the doctor in charge, and those with mental illness or cognitive and learning problems, as identified on their medical records.

Procedures

Approval for the study was obtained from the university and hospital ethics committees. Research assistants approached patients in the oncology outpatient clinic and asked them whether they were smokers or ex-smokers after the diagnosis of cancer. The eligible subjects were then invited to participate in this study after they were told the purpose of the study. They were given the option of participating or refusing involvement in the study and were told that their participation was voluntary without prejudice. Written consent was then obtained from all participants. Before the interviews, participants were invited to complete a one-page questionnaire on their socio-economic, demographic, and clinical characteristics. In addition, they were asked about their smoking history. Patients in the continuum from long-term smokers to ex-smokers without relapse were selected for interview. A one-to-one audiotaped semi-structured in-depth interview was then conducted with each participant until achieving data saturation. Each interview lasted approximately 40–50 min, and data saturation was achieved after interviewing a total of 20 current smokers and 20 ex-smokers.

Interviews were conducted in a cancer center by two fixed research assistants with considerable experience of conducting qualitative interviews. Interviews began with a board question ‘What age did you start smoking?’ and followed by specific questions with the purpose of encouraging the informants to provide more descriptions in relation to each episode. Examples of specific questions are shown in Table 1. During each interview, a research assistant acted as the interviewer to facilitate the informants to freely express their feelings, thoughts, and ideas. Another research assistant acted as an observer to document all non-verbal language of the informants.

The semi-structured interview guide was developed by the research team, which included a chair professor with extensive experience and knowledge in conducting research related to smoking, an assistant professor with rich experience in conducting qualitative studies, two postdoctoral fellows, and a research assistant. The interview guide was

Table 1. Example of specific questions

1. Was there any change in your smoking habit after you had been diagnosed with cancer?
2. What were the reasons for such changes?
3. Do you think your cancer is attributed to smoking?
4. What were the possible causes of your cancer?
5. What do you think about quitting smoking?
6. Have you ever tried to quit smoking?

further assessed for the relevancy and appropriateness of wordings by two nurse counselors with considerable experience of providing smoking cessation counseling. The interview guide was found to be relevant and appropriate, and no amendment was required.

Data analysis

After the interviews were conducted, the recordings were fully transcribed, verbatim, in Cantonese to capture nuances of expression unique to the dialect, and selected quotations relevant to the themes were later translated into English. In the coding process, two researchers were responsible for analyzing the narratives. The analyses began with an intensive examination of the transcriptions to search for general constructs and themes. Special attention was given to constructs that diverged from the major topics as framed by the guiding questions.

The transcriptions were first coded using the open coding method. Details in the interview conversations were closely examined to allow a large number of initial categories to emerge. As the number of codes grew, some closely related codes were merged, resulting in a smaller, more manageable set of codes. Selective coding was then adopted to code the transcriptions using the established categories. To facilitate the data analysis process, meetings were held to discuss emergent themes. During the coding process, any inconsistencies in the interpretation of quotations or the assignment of codes were resolved through discussions with the research team members. Finally, a complete set of codes was generated to facilitate comparisons and the development of themes and categories.

To achieve a more coherent and logical structure, the themes and categories were modified by breaking down concepts that were complicated, merging similar ones, and rearranging certain themes and categories relationships. The analyses were performed using NVIVO version 9 (QSR International Pty Ltd, Melbourne, Australia, 2010).

To ensure credibility of the data, the interviewer was first to ask iterative questions and use probes during the interviews. Second, debriefing sessions were held between the research assistants and the principal investigator after every five interviews. Modification was made by the principal investigator according to all developing ideas and interpretations. Third, the data analysis was performed by the two researchers independently, and field note was taken into account in the analysis. Regular research team meetings were held to resolve any disagreement rose. The informants were also invited to review the transcripts and clarify meaning of their statements. To strengthen transferability of the findings, this study was conducted in one of the largest oncology outpatient clinics in Hong Kong. Purposive sampling was adopted to maximize sample variation, leading us to obtain representative informants for interviews. To ensure confirmability and

dependability of the findings, an audit trail was conducted by another experienced researcher who did not belong to this research team. She reviewed a collection of documents, which attested to the interpretations of the researchers. No query and disagreement was raised during the process.

Results

One thousand and ninety-six cancer patients were screened at the oncology unit during the data collection period. We identified 241 patients (21.99%) who were smokers prior to their diagnosis of cancer. Of the 241 smokers examined in this study, 208 (86.31%) quit and 33 (13.69%) continued smoking after receiving a cancer diagnosis. A semi-structured in-depth interview was then conducted to 20 current smokers and 20 ex-smokers. Twenty-three cancer patients (10 current smokers and 13 ex-smokers) showed no interest in joining the study. The flow chart describes the recruitment process as shown in Figure 1.

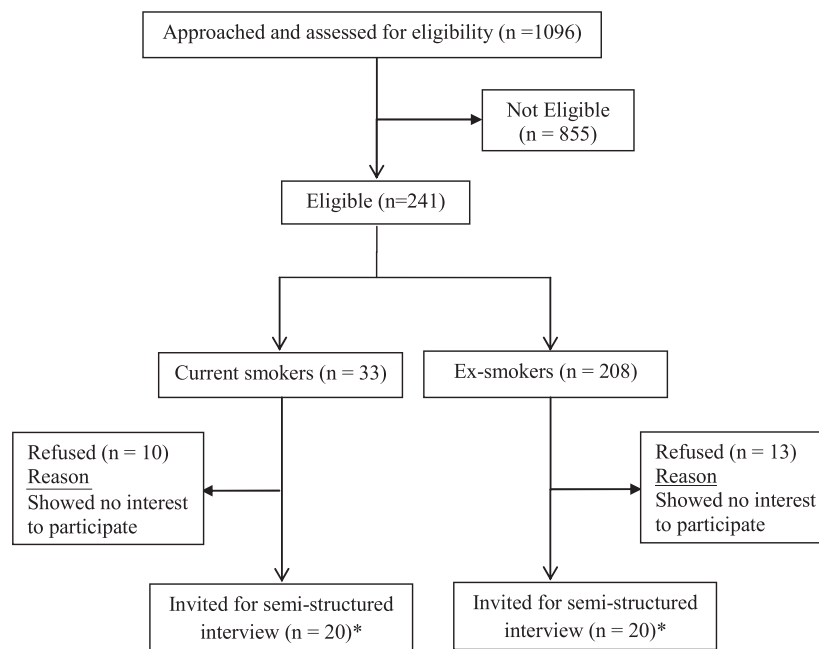
Characteristics of participants

The mean age of the participants was 57.2 (SD = 13.0) years. A majority of them were male (97.5%), and most of them were married (80%). Most (70%) of the participants had at least secondary education, and almost half (42.5%) were still working. The average time since cancer diagnosis was 2.7 years (ranged from 5 months to 9 years). Around 40% of the interviewees had cancer stage III or IV. Table 2 compares the socio-economic, demographic, and clinical characteristics of the current smokers and ex-smokers. The only statistically significant difference in the socio-economic, demographic, and clinical characteristics was the number of cigarettes consumed per day. The analysis of these data indicated that the current smokers were comparable with the ex-smokers with respect to age, sex, educational attainment, employment status, type of cancer, time since diagnosis of cancer, and stages of cancer.

Five themes were generated from the interviews: T1, knowledge of the association between smoking and cancer; T2, reasons for continuing smoking; T3, reasons for quitting smoking; T4, perceived benefits of quitting; and T5, perceived barriers to quitting. Each theme was further divided into categories. Themes, categories, and quotations representing the central content of each category are presented in Table 3.

T1. Knowledge of the association between smoking and cancer

Many of the informants who continued to smoke were unaware of the association between smoking and cancer. Some of the current smokers believed that smoking was only associated with cancers in the respiratory system.



* Data saturation was achieved after interviewing a total of 20 current smokers and 20 ex-smokers

Figure 1. A flow chart describing the recruitment process

Some of the smokers whose cancer was not in their respiratory system thought that it was safe to continue smoking. In addition, many current smokers did not realize the risks of continued smoking and the benefits of quitting in relation to treatment efficacy and their cancer prognosis. Unlike current smokers, most ex-smokers believed that there was a causal relationship between smoking and cancer.

T2. Reasons for continuing smoking

Many informants who continued to smoke believed that moderate smoking, such as less than half a pack of cigarettes a day, would not significantly harm their physical health. Other informants said that it was too late for them to quit smoking as the cancer had reached a later stage. Approaching the end of their lives, such smokers might feel hopeless and were not motivated to abstain from smoking.

T3. Reasons for quitting smoking

The majority of ex-smokers realized that there was a causal relationship between smoking and cancer, and believed that continuing to smoke would be further detrimental to their health. In addition, many of them believed that quitting could promote treatment efficacy and improve their cancer prognosis. Furthermore, many respondents expressed that their families provided substantial support for them to quit smoking. Some ex-smokers said that their family members became very worried about their health after the cancer diagnosis, and they frequently advised

them to abstain from smoking. They believed that quitting was something they could do for their families.

T4. Perceived benefits of quitting

Many of the ex-smokers stated that they quit smoking to improve their treatment efficacy and cancer prognosis. Some ex-smokers claimed that there was a need to save some money after having cancer and that smoking is costly.

T5. Perceived barriers to quitting

The most common reason given for continuing to smoke was that the current smokers did not perceive any benefits of quitting. In fact, many of them identified the barriers of quitting; in particular, when asked why they did not quit, many current smokers reported that because of nicotine dependency, they often experienced a strong desire to smoke and found it very hard to abstain from smoking. They found it particularly difficult to resist the desire to smoke when they were alone or felt bored. They slipped and relapsed on such occasions.

In addition, current smokers were more likely to perceive smoking as a social norm and as a tool for communication and connecting with friends. Many current smokers said that friends sometimes offered them cigarettes, and they felt it would be impolite or embarrassing to reject their friends' offer. This made them difficult to abstain from smoking.

Table 2. Differences in demographic and clinical data of participants who continued to smoke and who quit smoking after cancer diagnosis

	n (%)		χ^2	p
	Smokers (n = 20)	Ex-smokers (n = 20)		
Gender				
Male	20 (100)	19 (95)	1.03	0.31
Female	0 (0%)	1 (5)		
Areas of cancer				
Lung	5	7	5.25	0.52
Upper gastrointestinal	3	3		
Lower gastrointestinal	4	3		
Head and neck	5	5		
Genitourinary	3	2		
Educational attainment				
Primary school or below	7 (35)	5 (25)	5.17	0.52
Lower secondary school	4 (20)	5 (25)		
Upper secondary school	5 (25)	8 (40)		
Tertiary education	4 (20)	2 (10)		
Marital status				
Single	2 (10)	0	2.12	0.35
Married/cohabitation	15 (75)	17 (85)		
Divorced/separated	3 (15)	3 (15)		
Employment status				
Retired	7 (35)	9 (45)	0.45	0.79
Unemployed	4 (20)	3 (15)		
Employed	9 (45)	8 (40)		
Stages of cancer				
Stage I	2 (10)	2 (10)	1.10	0.78
Stage II	1 (5)	2 (10)		
Stage III	3 (15)	6 (30)		
Stage IV	4 (20)	3 (15)		
Unknown	10 (50)	7 (35)		
	M (SD)		t	p
Age	56.35 (13.73)	58.05 (12.61)	-0.41	6.89
No. of cigarette consumed per day	10.55 (7.37)	17.70 (12.85) ^a	-2.16	0.04
Time since diagnosis of cancer	2.45 (4.1)	2.90 (4.34)	-0.35	0.73

^aNo. of cigarette consumed per day before quitting.

Discussion

This study investigated, for the first time, the risk perceptions, and the behavior, attitudes, and experiences of Chinese current smokers and ex-smokers who have been diagnosed with cancer. One of the strengths of this study is the use of in-depth individual interviews to collect data from current smokers and ex-smokers. This method provided complex textual descriptions of their behavior, attitudes, and experiences related to smoking. Another strength is the originality and importance of the research question, which addresses an under-researched area as cancer patients are increasing locally and globally.

It is unclear how many smokers in Hong Kong have stopped or continued smoking after receiving a cancer diagnosis. This study adds originality to the literature by reporting such information. The prevalence appears to be much lower than that in the literature [6,15,16], which has indicated that about one-third of smokers continue smoking after diagnosis. Another study to examine the health behaviors and readiness to change among smokers

with lung cancer in USA revealed that 47% of the smoking cancer patients continued to smoke after their diagnosis [23]. Around 14% of the smoking cancer patients examined in this study continued to smoke after diagnosis, which is consistent with the low prevalence in the Hong Kong general population. Nevertheless, the figures reported here are based on a single oncology outpatient clinic although it is one of the largest outpatient clinics in Hong Kong.

The results showed that, in general, patients who refused to quit smoking subsequent to a cancer diagnosis thought that the drawbacks and barriers to quitting outweighed the perceived benefits of quitting. Although some current smokers were aware of the health hazards of smoking, they valued smoking as a way to relieve their psychological problems and were less concerned about the adverse consequences of smoking. This study revealed that many current smokers were not aware of the beneficial effects of quitting, including ameliorating therapy-related adverse effects and improving cancer prognosis and quality of life. Consistent to the findings of a previous

Table 3. A presentation of themes, categories, and quotations included in each category

Theme	Current smoker			Ex-smoker	
	Category	Sample quotation	Sub-categories	Sample quotation	
Knowledge of the association between smoking and cancer	Cancer is not attributable to smoking	'Those friends of mine who developed cancer weren't smokers. In contrast, the others who smoke three to four packs of cigarettes a day are in perfect shape.'	Smoking can cause cancer	'I think smoking and cancer are related, that's why I quit smoking right after my cancer diagnosis.'	
	Cancer is attributable to fate	'I think everything is determined by fate, including my cancer, which is unpreventable. It is not a matter of whether I continued smoking or not.'			
Reasons for continuing smoking/quit	Smoking has no effect on cancer: prognoses	'I have tried ceasing smoking for a week, but the cancer index still went up.'			
	Moderate smoking causes no harm	'What I strongly believe is that I only smoke four sticks per day, and it won't hurt me that much!'	Health and treatment efficacy	'I know smoking is hazardous to my health. I already got cancer; I don't want my health to get worse, that's why I quit smoking.'	
	Desensitized to tobacco smoke	'As we already have such a long smoking history, our body is already desensitized to tobacco smoke.'	Family support	'My wife and my sons often advised me to quit after I got the cancer. Indeed, without their support, I don't think I could have quit smoking successfully.'	
Perceived barriers/benefit to quitting	It is too late to quit	'The doctor told me that my cancer is now at stage IV and the disease can't be cured. I am expected to survive for another three months... what can I do? It's too late to quit.'			
	Quitting could harm the physical health	'Those who quit got diseases right away, and just died right away: this is what I witnessed.'	Better prognosis	'The doctor and nurses told me that quitting smoking can improve the cancer prognosis, that's why I quit.'	
	Quitting could remove the psychological benefits of smoking	'I am not considering quitting smoking right now as it helps me cope with stress and relieves my boredom.'	Saving money	'I have lost my job since I got cancer; I can't afford to buy two packs of cigarettes a day any more. Anyway, quitting can at least help me save some money.'	
	Social and interpersonal factors	'My colleagues sometimes give me cigarettes, and I don't know how to refuse them. I accept the cigarettes out of courtesy.'			

studies [11,16,17], the present study indicates that inadequate knowledge of the association between smoking and cancer was also common among Chinese cancer patients who smoke. Moreover, there were some misconceptions as many of them believed that smoking was not related to the cause of their disease. The results also showed that current smokers smoked less than the ex-smokers did before they quit, probably because many current smokers had a myth that smoking moderately was not detrimental to one's health. Furthermore, some even concluded that smoking does not cause cancer, as many people around them had never smoked but developed cancer and eventually died from it.

One interesting finding was that many smoking cancer patients had misconceptions about smoking. The most common misconception was that they believed their bodies had been desensitized to the chemicals in tobacco smoke as a result of long-term smoking. Therefore, they believed that continued smoking would not further affect their health, but quitting cigarettes would harm their physical well-being. In fact, desensitization of nicotinic receptors can occur as a result of extended nicotine exposure during smoking [24]. Yet, there is no evidence that such effect would not be further detrimental to the health of chronic smokers. Some current smokers also claimed that smoking had psychological benefits, and they worried about losing such benefits if they quit. Indeed, the very limited number of perceived benefits, combined with strongly perceived negative outcomes, contributed to the weak intention to quit smoking among many cancer patients.

Another important finding was that quite a number of cancer patients claimed that it was their fate to have cancer and that the disease was not related to smoking and thus could not be avoided. It has been well documented that Hong Kong Chinese people are influenced by Confucianism and the associated notion of fate [25]. Therefore, at least some cancer patients may think that there is very little that can be done to change their fate, and thus they have no reason to stop smoking after the diagnosis.

In contrast, cancer patients who were ex-smokers had quite different perspectives on quitting. Most of the cancer patients who quit after their cancer diagnoses thought that the perceived benefits of quitting greatly outweighed the perceived drawbacks and barriers to quitting. In general, their responses could be classified into two categories. First, they believed that there was a causal relationship between smoking and cancer. Second, they believed that quitting would be beneficial to treatment efficacy and their cancer prognosis. In addition, cancer patients reported that successful quitting was related to family support. Indeed, some evidence has suggested that social support and particularly family support play an important role in successful smoking cessation [26].

Limitations

This study has several limitations. First, the sample selection method might limit the generalizability of the results as all data were collected in one setting. Second, although the number of participants in this qualitative study is acceptable, the results did not show how socio-economic, demographic, and clinical characteristics affect the behavior of the patients. A future survey on a large and representative sample of cancer patients including current smokers and ex-smokers is needed to explore how socio-economic, demographic, and clinical characteristics influence smoking and quitting behavior. Third, participants in this study were asked to report their smoking status. However, some participants, in particular those current smokers, might deny that they had quit smoking because of social desirability. Therefore, future studies may consider using biochemical tests for the confirmation of smoking cessation.

Implications for practice

The findings of this study have important implications for research and clinical practice. Understanding how current smokers and ex-smokers perceive the risks of smoking, and their behavior, attitudes, and experiences related to smoking is an essential prerequisite for the design of an effective and appropriate smoking cessation intervention that can help cancer patients achieve a greater level of smoking abstinence and a lower level of relapse. Moreover, the results of this qualitative study can guide the development of protocols and interventions that will demystify the misconceptions about smoking among current smokers and increase their perception of the risks of continued smoking and benefits of quitting. Additionally, it is crucial to motivate more healthcare professionals to assess health behaviors of smoking cancer patients and to implement evidence-based interventions to help them quit smoking. Most importantly, healthcare professionals should be offered relevant training so as to enhance their self-efficacy and confidence in promoting smoking cessation to cancer patients. There are Chinese cancer patients who smoke who are living in many parts of the world other than China, Taiwan, Singapore, and Hong Kong. Healthcare professionals in other parts of the world may incorporate findings from this study when promoting health education or implementing interventions to help Chinese cancer patients to quit smoking.

Conclusions

This study has addressed a gap in the literature by examining the behavior and risk perceptions related to smoking and smoking cessation of smoking and non-smoking

cancer patients, an area of research that has been underrepresented in the literature. The findings can help guide the development of smoking cessation intervention for Chinese cancer patients.

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