Developing a Culturally Relevant Community Centered eHealth Smoking Cessation Intervention (CCeSCI): a Qualitative Study on the Beliefs and Attitudes of Chinese Smokers and Community Workers

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Thesis submitted in partial fulfillment of
the requirements for the degree of
Master of Science in the Duke Global Health Institute of
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2022

ABSTRACT

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Abstract

Background: The prevalence of smoking among Chinese men has been one of the highest globally despite decades of smoking cessation efforts. Previous studies suggest that smoking cessation interventions could be more effective in achieving abstinence when they are culturally adapted. Based on the "smoking rationalization belief" framework and recent development on electronic health (eHealth) technology, we developed the Community Centered eHealth Smoking Cessation Intervention (CCeSCI).

Research question: What are the common beliefs of East and Southeast Asian male smokers that make quitting so difficult, and how can we inform and refine the CCeSCI trial design and implementation in order to address those cognitive misconceptions and to achieve a better quitting outcome?

Method: We conducted a comprehensive literature review on the common beliefs of East and Southeast Asian smokers and a qualitative study on beliefs and attitudes of Chinese smokers and community workers to inform the CCeSCI study design and implementation. A total of eighteen in-depth interviews were conducted, including five with community workers and thirteen with adult male smokers. The smoking rationalization belief framework (including six domains) was used to guide the thematic analyses of the qualitative data.

Findings: Both the literature review and the qualitative study revealed that the six domains in the rationalization beliefs framework -- smoking functional beliefs, risk generalization beliefs, social acceptability beliefs, safe smoking beliefs, self-exempting beliefs, and "quitting is harmful" beliefs -- were the major themes of male smokers. In addition, fatalism, family matters, no need for help, indifference and pessimism, and "I can quit when I decide to" were the most popular attitudes among smokers. For community workers, the major themes were "environmental factors are the most important," "leadership support is crucial," "mixed attitudes regarding cessation clinics," and "individual willingness matters." We also identified some common barriers to smoking cessation efforts. We found high heterogeneity among smokers in their beliefs and attitudes, but less so for community workers.

Conclusions: Current smoking cessation efforts have largely neglected the rich diversity of rationalization beliefs among smokers and the misalignment of perceptions between community workers and smokers. Future interventions should focus more on addressing the specific psychological dependence of smokers and their rationalization beliefs by placing them at the center of their decision-making. Integrated with supply-side intervention in the communities and eHealth technologies, CCeSCI has a promising future in improving smoking abstinence with better acceptability, feasibility, and generalizability among adult male smokers in East and Southeast Asian countries.

Dedication

To Professor Pinpin Zheng and her team, whose hard work resulted in the discovery of the smoking rationalization belief framework of Chinese male smokers and the development and validation of the culturally adapted smoking rationalization scale.

To Professor Yiqun Wu, whose encouragement and inspiration sparked my passion for tobacco control and forged my courage and determination to fight the tobacco industry.

To my wife May and my son Haodi, thank you so much for indulging me on this opportunity to go back to school. I love you!

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1. Introduction

Smoking is one of the leading risk factors for early death and disability, and its contribution to disease burden globally is increasing. (Forouzanfar et al., 2016) In 2015, smoking claimed 6.4 million lives (11.5% of global mortality). (Reitsma et al., 2017) The situation is particularly alarming in east and southeast Asian countries. According to the latest statistics from the World Bank, the prevalence of current tobacco use among male adults in East Asia and the Pacific (excluding high income) is as high as 51% in 2020, the highest region in the world and the only region that is above 50%. (Bank, 2020) The following countries are the highest in this region (ranked by prevalence, >40%): Indonesia (71%), Myanmar (69%), Timor Leste (68%), Laos (53%), Bangladesh (52%), Mongolia (52%), China (49%), Nepal (48%), Vietnam (47%), Malaysia (44%), Sri Lanka (41%), India (41%), Thailand (41%). (Bank, 2020). Smoking is the most important modifiable behavioral risk factor affecting men's health (Pellmar et al., 2002) and an significant obstacle to economic development, accounting for approximately 0.7% of China's GDP (Ekpu & Brown, 2015). Cessation interventions may yield the largest marginal social and health benefits if successfully implemented in these countries.

Over the past decade, available evidence focusing on the impact of culture on health has increased dramatically. (Airhihenbuwa, 2007; Airhihenbuwa & Liburd, 2006; Dutta, 2007; Shaw et al., 2009) According to the anthropologist Edward T. Hall's cultural

context theory, different cultures have different ways of communicating; some communicate explicitly (low-context culture), while others communicate implicitly (high-context culture). (Hall, 1989) High-context cultures are cultures in which subtlety and collective understanding rule the day. Many Asian and Arabic countries fall into this category (including most of the abovementioned thirteen countries with a male smoking rate of more than 40%). Further historical studies on cultural beliefs have concluded that people in east and southeast Asian countries have similar cultural backgrounds and beliefs. (Ebrey & Walthall, 2013; Stuart-Fox, 2021) Despite recent modernization and democratization, Confucianism has remained the cultural foundation for social norms and political order in East Asia (Huang & Chang, 2017).These similarities in cultural beliefs inevitably lead to similar health policies and health behaviors of people living in this region, which makes a culturally appropriate smoking cessation intervention more generalizable transnationally in this particular region.

A major symbol of modernization is the wide use of mobile technologies such as social networks and online communication applications. Social network members with similar experience forming a support group to talk about and encourage certain health behaviors has become a mainstream approach in health intervention (Latkin & Knowlton, 2015), highlighting the significance of the competent communication skills of

the facilitators or interventionists in such interventions. For example, though peer mentoring has been proven to be effective (White et al., 2020), telling smokers that smoking is bad for their health may not be the best approach for a peer educator to initiate a conversation because such a statement may be perceived as judgmental. (Latkin & Knowlton, 2015)

A large body of evidence has suggested global mental health interventions need to have critical cultural awareness (Christopher et al., 2014) and that measurements and treatments that were developed in western countries need to be applied in other cultures with caution. (Kohrt et al., 2011; Sweetland et al., 2014) Among Chinese smokers who have no smoking-induced diseases, pharmacologic cessation treatments, proven effective in western clinical settings (General, 2020), are not well accepted. (Wang et al., 2015) Non-pharmacologic methods such as cognitive-behavioral interventions have been shown to have higher acceptability, especially when culturally adapted. (General, 2020) These findings call for a better understanding and the development of culturally appropriate instruments for smokers in non-western cultures.

Based on the smoking rationalization belief theory framework of Chinese male smokers (Huang et al., 2019) and the subsequently developed scale (Huang & ZHOU, 2016), we developed the Community Centered eHealth Smoking Cessation Intervention (CCeSCI) from February 2022 to June 2022. Figure 1 demonstrates the triangulated

mechanisms of action of the intervention for this intervention. Based on the five principles of developing mental health interventions proposed by Hanlon et al. (i.e. effectiveness, feasibility, equity, acceptability, and affordability) (Patel et al., 2013), our rationale for developing CCeSCI was as follows: (1) to integrate behavioral science-based interventions (community workers) with cognitive therapy-based interventions to achieve maximum potential effectiveness; (2) to take full advantage of the recent IT technology to develop an easy-to-use intervention to increase feasibility; (3) to come up with an inclusion criteria to include smokers in lower socioeconomic and educational status to increase equity; (4) to exclude pharmacological interventions to increase acceptability among smokers and to include non-medical background lay persons to increase acceptability among community workers; and, (5) to take advantage of the current human resource set-up in communities and widely available terminal devices to increase affordability. The biggest strength of CCeSCI is that it adopts the latest electronic health (eHealth) technology to create a personalized, yet generalizable curriculum that is evidence-based and involves participation from non-physician community workers as interventionists.

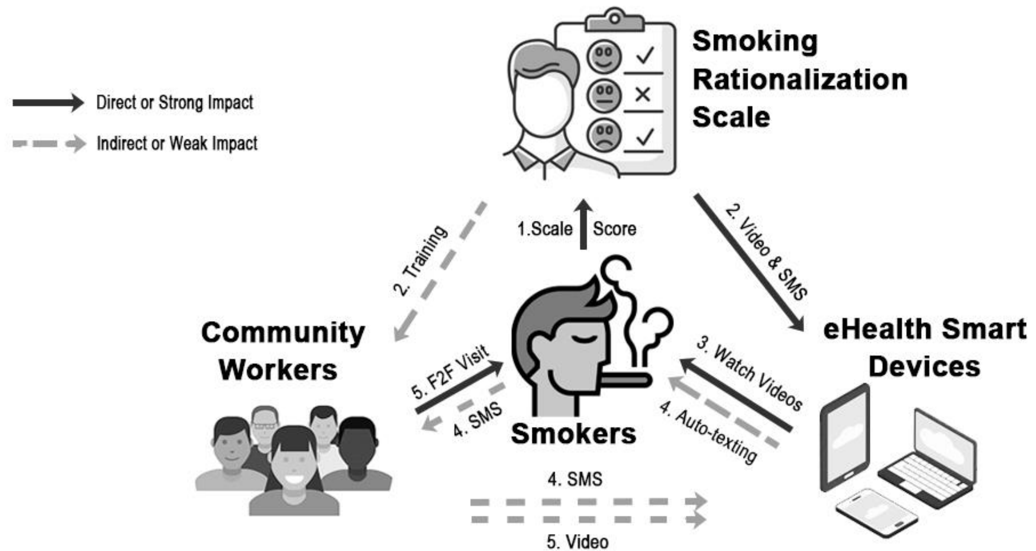

Figure 1: Community-Centered eHealth Smoking Cessation Intervention (CCeSCI) Mechanisms of Action

To test the effectiveness of CCeSCI, we have designed a randomized controlled trial (RCT) pilot study. The study received ethical approval from the Institutional Review Board at Duke Kunshan University (Approval No.: FWA00021580). The complete protocol was registered at clinicaltrial.gov (ID: 22KDKUF016). Due to funding and resource limitations, we are currently conducting a single-site pilot study in rural China. We hope our learning will enable us to scale up the RCT to cover more sites in other East and Southeast Asian countries in the future.

Our research question is "***What are the common misbeliefs of East and Southeast Asian male smokers that make quitting so difficult, and how can we inform and refine the CCeSCI trial design and implementation to address those cognitive misconceptions***

and to achieve a better quitting outcome?" This overarching research question has two specific aims. Our first aim is to gain a better understanding of the common misbeliefs of East and Southeast Asian male smokers by conducting a comprehensive literature review. Our second aim is to identify common misbeliefs and attitudes of Chinese smokers and community workers and to seek their comments to inform and refine the CCeSCI trial design and implementation for a better quitting outcome with higher acceptability through qualitative interviews.

2. Comprehensive literature review

The research question of our literature review was: "*What are the common misbeliefs that make quitting so difficult for east and southeast Asian adult male smokers?*" Our aim is to identify the common themes and synthesize the most popular misbeliefs that have been held steadfast by adult male smokers. We hypothesize that those cognitive misbeliefs and attitudes are the major barriers to smoking cessation efforts by healthcare professionals.

2.1 Search strategy

We developed a literature review search strategy following systematic review process. (See Appendix A for details) In the end, twenty-one papers were included in the review (see Figure 2: Flow diagram of study selection). Data sources are from PubMed and CNKI since establishment. Both databases house abundant literature in the health field in English and in Chinese, respectively. We are not aiming to conducting a full-scale systematic review to achieve inclusiveness and completeness. Our primary goal for this review is to achieve sufficient working knowledge to better inform our study design.

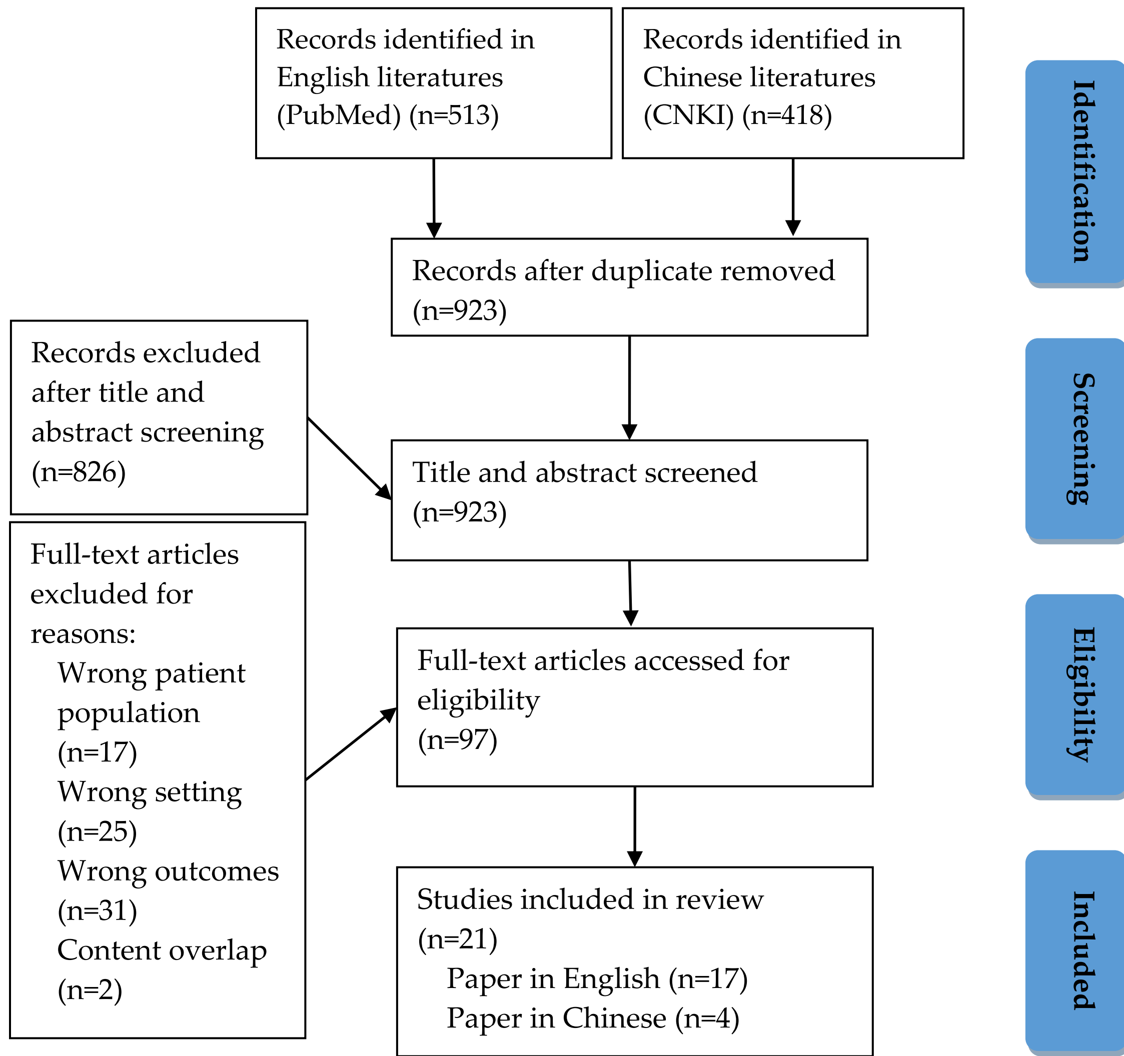

Figure 2: Flow Diagram of Study Selection

2.2 Study characteristics

Out of the twenty-one studies that passed the full text review, there are twelve papers that covered China or Chinese immigrants; five papers covered Vietnam or Vietnamese immigrants; five covered Malaysia or Malay immigrants; three covered Thailand or Thai immigrants; three covered Cambodia or Cambodian immigrants; and

two covered Laos or Laotian immigrants in our smoker target list. Seventeen papers are written in English, and four papers are written in Chinese. The oldest article was published in 1999, and the most recent one was in 2021.

Regarding study design, there are eight qualitative studies and eight cross-sectional studies. The rest are one case control study (Pan. L & C, 2015), one cohort study (Lee et al., 2009), one quasi-experiment study (Lin & Sloan, 2015), one randomized control trial (Yasin et al., 2012), and one mixed method study (Jackson et al., 2004).

Regarding participants, except for one study with only 39% (Jiraniramai et al., 2015), one study with 53% (Burgess et al., 2014), one study with 55% male (Jackson et al., 2004) and two with an unknown percentage (Ma et al., 2008; Yasin et al., 2012), the rest of sixteen studies focused predominantly on male smokers (90%+) and 11 studies focused solely on male smokers (100%). This has enabled our literature review to have a specific focus on male smokers. The combined participants have reached a total of 35,511, and the qualitative study pool is as large as 733.

As for the participants' age structure, most are older smokers (middle age and up). Three studies (Jiraniramai et al., 2015; Lu et al., 2017; Yasin et al., 2012) included participants of 17 years and below, one study (Ma et al., 2008) did not specify. Rest studies only include adult participants aged 18 and up. Even for those few studies that

did include young participants, the actual participants fall predominantly into middle and older age groups.

2.3 Literature review findings

Table 2 summarizes major findings on the beliefs and attitudes of East and Southeast Asian male smokers. To synthesize our findings, we used the framework of the smoking rationalization scale for Chinese male smokers developed by Huang et al. in 2020. (Huang et al., 2020) Table 3 summarized this framework in more detail. Our rationale for using this framework is: (1) this framework was based on an extensive qualitative study on Chinese smokers across different geographic regions, so it should have captured most of the representative misbeliefs; (2) this framework was recently developed, so it should be more fitting for current smokers; and (3) more than half of the studies primarily focused on Chinese smokers. We use this framework to check if the studies in our review have covered similar themes. If the framework fails to capture any themes that were prominent in these studies, we put them in a new column of "other" and fill in the specific themes that were missing. The synthesized results are shown in table 4.

Table 1: Smoking Rationalization Belief ScaleDomain, Descriptive Items, Validity and Reliability Measures, and Culture Saliency Ratings on Chinese Male Smokers (n = 3,665)

Domain	Items [a]	Agree or Strongly Agree [b] (%)	Subscale mean [b] (SD)	Cronbach's α	Culture saliency [c]
Smoking Functional (SF) Beliefs	*"Smoking can relieve tension and stress"*	69.8	3.64 (0.69)	0.82	High
	"Smoking can eliminate fatigue and be refreshing"	69.7			
	"Smoking is good for inspiration and active thinking"	54.6			
	"Smoking is a good way to kill time"	54.8			
	"Smoking can reduce interpersonal distance and make social interaction easier"	63.1			
Risk Generalization (RG) Beliefs	*"A lot of non-smokers also get lung cancer"*	59.6	3.50 (0.72)	0.61	Low
	"Air pollution, food safety and life stress is much more dangerous to health than smoking"	54.7			
	"If smoking was so bad for health, the government would have banned tobacco sales"	48.2			
Social Acceptability (SA) Beliefs	*"There are so many smokers in society, so it's hard for you to be different"*	45.1	3.32 (0.70)	0.82	Very High
	"Many famous people smoke, so it is normal to smoke"	43.7			
	"Smoking is pretty normal for men"	51.7			
	"Smoking is part of my lifestyle that others can't interfere with"	48.2			
	"I will consider quitting smoking only if the government closes the tobacco factory"	43.3			
	"Lots of doctors smoke, so it's unconvincing for them to persuade me to quit"	43.9			

Table 1: Smoking rationalization belief scale summary (continued #2)

Domain	Items [a]	Agree or Strongly Agree [b] (%)	Subscale mean [b] (SD)	Cronbach's α	Culture saliency [c]
Safe Smoking (SM) Beliefs	*"If you don't inhale the smoke into the lungs, the harm is minimized"*	41.1	3.29 (0.74)	0.77	High
	"People like me who do not smoke many cigarettes are not at risk of smoking health problems"	33.3			
	"Low tar cigarettes can reduce the harms of smoking/is less harmful"	43.9			
	"It's safe to smoke high-quality cigarettes"	39.9			
Self-Exempting (SE) Beliefs	*"There is still insufficient medical evidence to prove that smoking is harmful"*	41.3	3.08 (0.77)	0.78	Low
	"I have not experienced any harm to my health"	42.2			
	"I think I may have genes which protect me from the harms of smoking"	28.1			
	"Smoking is not always bad for you because many smokers live long lives while many non-smokers don't"	35.7			
	"The fact that I can still smoke means my health status is not bad"	37.3			
"Quitting is Harmful" (QH) Beliefs	*"If you have smoked for a long time, the body would adapt to the cigarette and reach a balance and quitting will lead to illness"*	44.2	3.28 (0.73)	0.74	Very High
	"If you try to quit and fail, you will smoke more than before, so you would rather not quit"	42.5			
	"After quitting smoking, I will gain weight, which is also harmful to health"	29.6			
Total			3.30 (0.56)	0.92	

SD: standard deviation

a: Domain and items were extracted from qualitative interview and focus groups with 201 male smokers in China. (Huang et al., 2020)

b: Scores and ratings were calculated based on 3,665 survey respondents, where strongly agree is 5 and strongly disagree is 1. (Huang et al., 2020)

c: culture saliency means the degree of saliency compared to smokers in western cultures. The ratings are based on literature review

Table 2: Summary of Previous Study Findingson the Beliefs and Attitudes of East and Southeast Asian Male Smokers

Author, Year[†]	Country/Ethnicity	Study Design	Male %	Age Range, Mean (SD)	Total # of participants	Result (major perceptions found)
(Lafferty et al., 1999)	Immigrants from Laos, Vietnam and Cambodia in the US	Cross sectional study	100%	Cambodian: 44 (13) Laotian: 42 (12) Vietnamese: 35 (12)	312 (101 Cambodian, 132 Laotian and 79 Vietnamese)	(1) Strong sense of fatalism that smoking-related health problems stem from external factors such as bad luck. (2) Attribute cancer to immoral lifestyle choices.
(Tu et al., 2000)	Chinese; Vietnamese and Korean immigrants in the US	Qualitative research	100%	17-83, 45.1	34	(1) Smoking was culturally appropriate. The act of offering a cigarette was described as an important social exchange. To refuse would be impolite and disrespectful. Smoking expensive cigarettes as representing social status or wealth. (2) Smoking was "fun", "relaxing" and "pleasurable". Smoking was a "leisure activity" and relieved boredom. (3) Smoking is being part of the "circle" and not being an outsider. As a first exchange, the offer of cigarettes serves to break the ice in social and business encounters. (4) Smoking also was referred to as a rite of passage. It was perceived as a characteristic of being a man. (5) Participants questioned the effectiveness of quitting smoking. For those who attempted to quit, the process was described as painful, physically and psychologically. It also led to a sense of loss and loneliness. Smoking is a friend–a loss if you give it up.
(Jackson et al., 2004)	Malaysia	Mixed method	55%	For qualitative research: 17+, mean 45 For quantitative research: 10-59	Qualitative research: 22 Quantitative research: 1,044	(1) Smokers could do something to make smoking safe such as drinking water (36%), use a filter (31%), smoke after food (14%), and take sour fruit (11%). (2) Main explanations for water: it cleaned or moistened the lungs or throat. Sour fruits: cleaning, "sharp", able to scrape out the essence of cigarette.

Table 2: Summary of Studies (continued #2)

Author, Year	Country/Ethnicity	Study design	Male (%)	Age range, Mean (SD)	Total # of participants	Result (major perceptions found)
(Spigner et al., 2005)	Chinese; Vietnamese and Cambodian immigrants in the US	Qualitative research	100%	Mandarin speaking: 20 – 40 (mean 24)/41 – 65+ (mean 58) Cantonese: 20–40 (mean 34)/41 – 65+ (mean 51) Vietnamese: 20–40 (mean 31)/41 – 65+ (mean 59)	30 (Vietnamese: 9, Mandarin speaking: 12, Cantonese speaking: 9)	(1) Smoking occurred in the context of wanting to be social, friendly, or amiable around others, esp. while working (or relaxing) with colleagues and supervisors. (2) Cultural and gender norms played an important role in contextualizing the act of smoking: "As men, we greet each other and offer one another a cigarette." (3) Less awareness of tobacco-related diseases except cancer. (4) Nicotine withdrawal causing disequilibrium. (5) Expressions of forlornness, tension, and agitation seemed more prominent among the older participants. (6) Major reason of smoking is for the sheer pleasure of it, and yet this "enjoyment" was often mixed with expressions of worry and even discomfort.
(Ma et al., 2008)	China	Qualitative research	N/A	N/A	80 focus groups and 30 in-depth interviews with both smokers and non-smokers	(1) Smoking is an individual freedom; (2) Cigarette use is an important social and cultural tradition; (3) Tobacco is a significant contributor to the economy; (4) It is normal for teachers and doctors to smoke; (5) Smoking is not illegal. Therefore, there should not be policies regulating its use; (6) The dangers of smoking are not severe and can be controlled; (7) The harms caused by good quality tobacco are less than the harms caused by poor quality tobacco; (8) The risks of second-hand smoke can be eliminated by good air circulation.

Table 2: Summary of Studies (continued #3)

Author, Year	Country/Ethnicity	Study design	Male (%)	Age range, Mean (SD)	Total # of participants	Result (major perceptions found)
(Lee et al., 2009)	Malaysia; Thailand	Cohort study	95.1% (Malaysia), 92.3% (Thailand)	18+ (65.8% smokers in Malaysia and 65.5% smokers in Thailand are from age 25-54)	4,006 (Thailand: 2,000, Malaysia: 2,006)	(1) 79.0% of Malaysian smokers and 92.2% Thai smokers regretted smoking by approving this statement: "If you had to do it over again, you would not have started smoking". (2) 49.1% of Malaysian smokers and 9.5% Thai smokers rationalized their smoking by approving this statement: "You've got to die of something, so why not enjoy yourself and smoke." (3) Thai smokers reported more negative social norms toward smoking than Malaysian smokers by approving the statement: "society disapproves of smoking" (Mean for Thailand: 3.98, for Malaysia: 3.35, whereas 5 means strongly agree)
(King et al., 2010)	Malaysia; Thailand	Cross sectional study	95.3% (Malaysia), 94.5% (Thailand)	18+, 66% in Malaysia and 73.9% in Thailand are in age 25-54	2006 adult smokers from Malaysia 2000 adult smokers from Thailand	(1) Malaysian smokers reporting current use of light or menthol cigarettes were more likely to believe that they are less harmful. (2) Reported use of lights did not relate to beliefs for Thai respondents. (3) The belief that light and/or menthol cigarettes are less harmful was strongly related to the belief that they have smoother smoke.
(Yasin et al., 2012)	Malaysia	Randomized controlled trial	N/A	9-42, 17	185	(1) Non-quitters perceived physical attraction is a more important reason for them to quit compared to quitters before engaging in a quit attempt. (2) Older smokers ($\geqslant$ 51 years) were less likely to perceive the benefits of smoking cessation compared to younger smokers.

Table 2: Summary of Studies (continued #4)

Author, Year	Country/Ethnicity	Study design	Male (%)	Age range, Mean (SD)	Total # of participants	Result (major perceptions found)
(Burgess et al., 2014)	Laos; Vietnam; Hmong, Khmer (Cambodian)	Qualitative research	53%	Hmong: 43.9 (15.1) Cambodian: 56.7 (8.8) Vietnamese: 60.3 (2.1) Lao: 55.7 (13.1)	60	(1) Cigarettes were an integral part of gift-giving and men used them to forge and strengthen social bonds. (2) Tobacco brands are symbols of social class. (3) The act of smoking was bound up with sensibilities about masculinity and seen as part of manhood. (4) To cope with fear, alleviate stress, anxiety, and depression. (5) Value tobacco for its purported medicinal properties. (6) Women who smoked were often ostracized and targeted with gossip and innuendo about being a prostitute.
(Jiraniramai et al., 2015)	Thailand	Cross sectional study	39.4%	12-65	3,687	(1) Risk-minimizing belief was common in current smokers. Being male, older age, and higher personal income were strongly associated with risk minimization. (2) Older men are more likely to have positive perceptions about smoking and social acceptability of smoking. (3) Older smokers have less perceived vulnerability towards the harms of smoking and are less likely to quit smoking.
(Pan. L & C, 2015)	China	Case control study	100%	92.52% are middle age and up in successful quitter group, and 83.57 are middle age and up in failed quitter group	1,429 (Current smokers: 596, former smokers: 833)	(1) Agreeing genetic causes have important impact on smoking: Quitters: 33.5%, failed quitters: 32.9% (2) Agreeing smoking behavior is decided by personal genetic heredity: Quitters: 14.6%, failed quitters: 14.1% (3) Agreeing quitting is very difficult because smoking is determined by personal genetic heredity: Quitters: 10%, failed quitters: 9.1% (4) Agreeing quitting is very difficult because smoking is addictive: Quitters: 70.9%, failed quitters: 78.9% In total, 79.8% successful quitters attributed smoking to genetic causes, as compared with 85.4% failed quitters.

Table 2: Summary of Studies (continued #5)

Author, Year	Country /Ethnicity	Study design	Male (%)	Age range, Mean (SD)	Total # of participants	Result (major perceptions found)
(Elton-Marshall et al., 2015)	China	Cross sectional study	94.8%	18+	5,166	(1) A greater proportion of 'light/low tar' smokers 'agreed' or 'strongly agreed' that their brand of cigarettes was smoother. (2) Smokers who perceive that their cigarettes are smoother than other brands are more likely to say that their brands are less harmful.
(Zhao & Davey, 2015)	China	Qualitative research	100%	63-85	26	(1) Tobacco and agriculture: smoking helps maintain energy and motivation during farm work, is a remedy for tiredness and fatigue, repels mosquitoes and is resting with colleagues; Home-made cigarettes are superior, authentic and high quality. (2) Sociality and normalization of smoking: smoking was a prized quality of being sociable, a ritual of social interaction, a sign of masculinity. Women smokers were seen as being rebellious and naughty. (3) Local understandings of health and tobacco: home-made cigarettes were beneficial for health and a remedy for ailments. Smoking heightened sense of euphoria and well-being. (4) Romanticizing tradition, contesting modernity: the participants perceived a dual meaning of tobacco as both an orientation to tradition, which they envisioned as ideal, balanced with acceptance of the current situation and taking into account the perspectives of younger people, shifting back and forth between idealism and realism.
(Lin & Sloan, 2015)	China	Non-randomized experimental study	100%	41.67	5,032	(1) Persons living in a building with a lung cancer patient were much more likely to report that lung cancer was "definitely" more likely if they smoke. (2) Respondents thought the link between smoking and on set of heart disease and of stroke is weaker than between smoking and lung cancer and other respiratory diseases.

Table 2: Summary of Studies (continued #6)

Author, Year	Country/Ethnicity	Study design	Male (%)	Age range, Mean (SD)	Total # of participants	Result (major perceptions found)
(Huang & ZHOU, 2016)	China	Cross sectional study	100%	18-93, 40.5 (2.4)	3,779	(1) 44.2% smokers agree that "if you have smoked for a long time, the body would adapt to the cigarette and reach a balance and quitting will lead to illness" (2) 42.3% smokers agree that "if you try to quit and fail, you will smoke more than before, so you would rather not to quit" (3) 29.6% smokers agree that "after quitting smoking, I will get weight, which is also harmful to health" (4) The harmful beliefs to quit smoking was related to the willingness to quit smoking. Harmful beliefs to quit smoking are popular among Chinese smokers.
(Lu et al., 2017)	China	Cross sectional study	100%	15+ (98.8% are 30+ for farmers, and 80% are 30+ for non-farmers)	1,001	(1) Smoking functional beliefs: Farmers: 73.6%, Non-farmers: 74.9% (2) Risk generalization beliefs: Farmers: 63.4%, Non-farmers: 69.2% (3) Social acceptability beliefs Farmers: 70.1%, Non-farmers: 66.3% (4) Safe smoking beliefs: Farmers: 56.2%, Non-farmers: 42.9% (5) Self-exempting beliefs: Farmers: 54.9%, Non-farmers: 41.7% (6) Quitting is harmful beliefs: Farmers: 49.8%, Non-farmers: 39.9% Total rationalization beliefs: Farmers: 70.8%, Non-farmers: 65.6%
(Huang et al., 2019)	China	Cross sectional study	100%	18+, 40.5 (14.4)	3,721	(1) Smoking functional beliefs: 3.6 (0.7) [‡] (2) Risk generalization beliefs: 3.5 (0.7) (3) Social acceptability beliefs: 3.3 (0.7) (4) Safe smoking beliefs: 3.1 (0.7) (5) Self-exempting beliefs: 3.1 (0.8) (6) Quitting is harmful beliefs: 3.2 (0.8)

Table 2: Summary of Studies (continued #7)

Author, Year	Country/Ethnicity	Study design	Male (%)	Age range, Mean (SD)	Total # of participants	Result (major perceptions found)
(Chean et al., 2019)	Malaysia	Qualitative research	98%	40-82, 58 (10.8)	57	(1) Smoking is regarded as self-determined lifestyle choice. (2) It was normal for smokers to offer their friends and relatives cigarettes as a sign of goodwill and a close relationship. (3) Smoking a small amount of cigarettes would not affect their ability to quit smoking. (4) Smoking cessation is just a game of the mind. (5) Smoking cessation is harmful to health. (6) Developed defense mechanisms to ward off the concept that smoking is dangerous/unacceptable. (7) Most believe that pharmacotherapy was ineffective and willpower is necessary or sufficient for quitting
(Mao et al., 2020)	China	Cross sectional study	95.7%	18-75, 43.91 (11.95)	1,388	(1) Smoking can prevent COVID-19 (incorrect): 10.4% (2) Fine particles produced by smoking may increase the spread of virus (correct): 32.1% (3) Smoking harms my lungs, and is a barrier in prevention of COVID-19 (correct): 6.8% disagreement (4) Cigarette smoke is helpful in killing the virus of COVID-19 (incorrect): 11.5% Agreement Overall cognition of four items: At least one incorrect: 81.8%
(Do et al., 2020)	Vietnam	Qualitative research	100%	18-64, 42.2	71	(1) Need to smoke to cope with stress/pressure from work, concentrate, or fight against sleepiness. (2) Smoke when drinking alcohol, tea, or coffee by themselves or with friends at parties or coffee shops. (3) Needed to smoke when felt stressed or sad. Smoking is a long-time habit that was difficult to give up. (4) Believing that quitting is very hard or almost impossible was the most common reason for not wanting to quit.

Table 2: Summary of Studies (continued #8)

Author, Year	Country/Ethnicity	Study design	Male (%)	Age range, Mean (SD)	Total # of participants	Result (major perceptions found)
(Xia et al., 2021)	China	Qualitative research	100%	22-46, 33.7(5.8)	25	(1) Sharing cigarettes was an efficient method to establish initial relationships with customers. It is impolite to refuse a shared cigarette. (2) Smokers felt that the negative effects of smoking and second-hard smoke on health were exaggerated by healthcare professionals. (3) Although smoking may affect the quality of sperm, this effect may not persist after conception. (4) The negative health impacts of smoking developed slowly and would occur in the distant future, when they are old and get sick whether they smoke or not. (5) The participants reported that smoking cessation was a minor, personal issue, and therefore seeking help from official services was unnecessary.

Table note:

† : Studies are ordered by the time of publishing.

‡ : This is the mean score followed by standard deviation in the parenthesis, where strongly agree is 5 and strongly disagree is 1.

Table 3: Synthesized Results of the Rationalization Beliefsof Male Smokers in East and Southeast Asia Using Smoking Rationalization Belief Framework for Chinese Male Smokers

Author, Year	SF	RG	SA	SS	SE	QH	Other Themes
Lafferty 1999		RG	SA				Fatalism
Tu 2000							Quitting is painful
Jackson 2004				SS			
Spigner 2005	SF		SA		SE	QH	Quitting is painful
Ma 2008	SF	RG	SA	SS	SE		The right to smoke
Lee 2009		RG	SA				Fatalism
King 2010				SS			
Yasin 2012	SF		SA				
Burgess 2014	SF		SA				Smoking is good for health
Jiraniramai 2015		RG	SA				
Elton-Marshall 2015				SS			
Pan 2015					SE		
Lin 2015					SE		Made-up health beliefs
Zhao 2015	SF		SA				smoking is good for health
Huang 2016						QH	
Lu 2017	SF	RG	SA	SS	SE	QH	
Chean 2019	SF	RG	SA	SS	SE	QH	There is no need for support
Huang 2019	SF	RG	SA	SS	SE	QH	
Mao 2020	SF						Made-up health beliefs
Do 2020	SF		SA				Quitting is painful
Xia 2021	SF	RG	SA		SE		There is no need for support

Abbreviations:
SF: Smoking Functional Beliefs
RG: Risk Generalization Beliefs
SA: Social Acceptability Beliefs
SS: Safe Smoking Beliefs
SE: Self-Exempting Beliefs
QH: Quitting is Harmful Beliefs

2.3.1 Six popular rationalization beliefs persisted over time

The six themes in the rationalization belief scales have kept emerging in the previous studies. The six themes are:

(1) Smoking Functional Beliefs. It means smokers believe smoking has various functions or utilities, such as eliminating fatigue, being good for inspiration and active thinking, making social interaction easier, killing time, or relieving tension or stress, etc. These beliefs were found to have the highest ratings by Chinese smokers (Huang et al., 2020) and are shared by smokers not only in East and Southeast Asia (Burgess et al., 2014; Chean et al., 2019; Do et al., 2020; Spigner et al., 2005; Yasin et al., 2012) but also in western cultures. (Fotuhi et al., 2013; Oakes et al., 2004) The social function of smoking is easy to be confused with social acceptability beliefs. The major difference lies in whether smokers actively use cigarettes as a tool to build social bonds with others or passively accept the norms to be part of the smoking culture. For example, if you offer a cigarette to a stranger to make friends, then you are holding the smoking functional belief while the one who receives your cigarette hold a social acceptability belief. When smokers have strong functional beliefs, they tend to compare the benefits of smoking versus the perceived harms of smoking. In a utilitarian's eye, it would be rational to continue smoking to receive those benefits. It is noteworthy that smoking for the sheer pleasure of

it was expressed as the over-riding reason for smoking, and yet this "enjoyment" was often mixed with expressions of worry and even discomfort. (Spigner et al., 2005)

(2) Risk Generalization Beliefs. It means smokers generalize the risk of smoking to other common risks and believe the risk of smoking is acceptable or neglectable. This is also a cross-cultural belief shared by Australian, British, Canadian, and American smokers. (Fotuhi et al., 2013; Oakes et al., 2004) However, this theme received mixed endorsement from smokers compared to other themes. As much as 49.1% of Malaysian smokers and as few as 9.5% of Thai smokers agreed that "You've got to die of something, so why not enjoy yourself and smoke?" (Lee et al., 2009)

(3) Social Acceptability Beliefs. It means smokers view society as accepting of smoking or even encouraging smoking, so that it is normal (for men) to smoke, and accepting cigarettes is considered polite, while refusing would be impolite and disrespectful. (Tu et al., 2000) This theme has many sub-themes and is quite salient to smokers in eastern cultures. The sub-themes include cultural, social, and gender-specific norms. Cultural norms include accepting cigarettes as a gift at weddings, funerals, or other important social gatherings. (Burgess et al., 2014) Accepting cigarettes in social encounters to forge and strengthen bonds, as well as being easygoing and not being different, are examples of social norms. (Burgess et al., 2014) Many workplaces have a smoking culture. Males will need to accept smoking to join the circle of colleagues and

to engage with supervisors. (Spigner et al., 2005) Lastly, gender-specific norms are prevalent. Being female is a protective factor against smoking. Smoking was only regarded as normal and prevalent among men, a sign of masculinity. (Burgess et al., 2014; Zhao & Davey, 2015) Even in China's Dai culture, where smoking was considered a cultural heritage, women smokers were labelled with negative stature and traits such as being rebellious and naughty. (Zhao & Davey, 2015) Southeast Asian girls and young women who smoked were often ostracized and targeted with gossip and innuendo about being prostitutes. (Burgess et al., 2014) It is interesting to note that although western society nowadays does not accept smoking as a social norm, there was a long history of tobacco and the nuances surrounding its tasteful (or otherwise) consumption reflected fine gradations in social standing and position in the western world, as documented by Rudy, J.'s book *The Freedom to Smoke: Tobacco consumption and identity*. (Rudy, 2005)

(4) Safe Smoking Beliefs. It means smokers believe they can actively take measures to minimize the harm of smoking. For example, they can choose low-tar cigarettes or use filters, buy an expensive brand, smoke less, or not inhale the smoke into the lungs. These beliefs are quite common in under-developed regions and secluded communities. In eastern cultures, natural products like fruits, food, and herbs are often considered to have medical properties. (Weng & Chen, 1996) Research on Malay

smokers has found that "smokers could do something to make smoking safer, such as drinking water, using a filter, smoking after food, and taking sour fruit. The main explanations for water were that it cleaned or moistened the lungs or throat. Sour fruit was described as cleaning and sometimes as "sharp," able to scrape out the essence of cigarettes. (Jackson et al., 2004) Those lay beliefs are deeply rooted in local culture and have been passed on for many generations. Some smokers believe that they will experience less harm by smoking light or menthol cigarettes instead of regular ones (Kozlowski & Pillitteri, 2001; Shiffman et al., 2001). The tobacco industry was aware of these beliefs and created some new products accordingly. Tobacco advertisements focused on associating light or menthol brands with healthiness to comply with direct sensory impressions and folk beliefs about the medicinal properties of menthol. (King et al., 2010) Also, many smokers believe choosing cigarettes with filters or smoking a high-quality brand (often more expensive) would cause less harm. (Kozlowski & O'connor, 2002; Ma et al., 2008; Xia et al., 2021; Zhao & Davey, 2015) These beliefs were rooted in the cultural background and penetrated by the tobacco industry's marketing efforts.

(5) Self-Exempting Beliefs. It means smokers believe they might be exempted from the harms of smoking because they have good genes and haven't experienced harm to their health. There are many examples of smokers who lived a long life compared to non-smokers who died early. These beliefs were found to be very popular

among western smokers as well. (Chapman et al., 1993; Oakes et al., 2004) Oakes et al. did thorough research on Australian smokers' self-exempting beliefs and divided them into four categories: "bulletproof," "skeptic," "jungle," and "worth it". They found older smokers tended to hold more such beliefs, and the "worth it" belief was the most powerful belief that prevented smokers from quitting. (Oakes et al., 2004) The researchers speculated that the prevalence of such beliefs may suggest confusion about smoking being a *risk* rather than a *probable cause* of illness. (Oakes et al., 2004) Pan et al. found that in Chinese smokers, attributing smoking to genetic causes is a risk factor for successful smoking cessation. (Pan. L & C, 2015) Self-exempting beliefs were also widespread among Malay smokers. The research suspects that they probably represent an extension of the traditional humoral system. (Jackson et al., 2004) We see a widespread of these beliefs among global smokers while east and southeast Asian smokers seem to also attribute these beliefs to cultural factors.

(6) Quitting is Harmful Beliefs. It means smokers believe quitting is harmful because their body has achieved an equilibrium with cigarettes and any disruption of this balance will lead to bad health outcomes. Smokers often use withdrawal symptoms to justify their beliefs. Though Chinese researchers concluded that "quitting is harmful beliefs" appear to be a unique phenomenon among male smokers in China (Huang et al., 2020), it appears that smokers in Malaysia also share these lay beliefs. (Chean et al., 2019;

Spigner et al., 2005) However, those beliefs were not found to be shared by western smokers. Researchers believe those beliefs were influenced by cultural beliefs. (Huang et al., 2020) Huang et al. also further explored the association between "quitting is harmful" beliefs and willingness to quit. The result showed the higher the score of such beliefs, the lower the possibility of quitting smoking. (Huang & ZHOU, 2016)

2.3.2 Other misbeliefs and attitudes among smokers

Besides the six rationalization beliefs among East and Southeast Asian smokers, the literature also documented a few less common but noteworthy themes. **The first one is the "smoking is good for health" belief.** This belief was found by two studies in the review. (Burgess et al., 2014; Zhao & Davey, 2015) This belief originated from the cultural heritage that romanticized tobacco's medical utilities to treat ailments. These were found in the Dai people of Xishuangbanna in southwestern China, which has a geographically close approximation to Myanmar, Lao, and Vietnam. The Dai people are closely related to the Thai and Lao peoples and to ethnic groups in Myanmar and Vietnam. (Zhao & Davey, 2015) Since the smokers link their cultural pride to tobacco products and smoking, the modern health concept and harms of smoking would be expected to get a huge pushback from the local smokers.

The second one is "fatalism" attitude. While one would argue that fatalism could be categorized under risk generalization beliefs, it is more of an attitude which

views every event in one’s life is predetermined and therefore inevitable. This attitude is distinctly different from risk generalization beliefs since it is considered as a way of being, a life philosophy that any change in behavior (e.g. stop smoking) has little or no impact on the ultimate outcome (e.g. getting cancer). Lafferty et al. discovered that Southeast Asian male immigrants expressed a strong sense of fatalism, reporting that smoking-related health problems are caused by external factors such as bad luck. (Lafferty et al., 1999) There’s evidence that Asians may use some culture-specific beliefs, particularly fatalism attitude, to cope with their death awareness. (Yen, 2013) Though it helps lower the anxiety of death in catastrophic events (Christopher et al., 2014), it also poses a barrier to changing modifiable health behaviors.

The next two beliefs are regarding quitting. One belief is that "quitting is painful" and the other is that "there is no need for support". Those two beliefs might seem contradictory, but they are both prevalent among smokers in east and southeast Asian countries. (Chean et al., 2019; Do et al., 2020; Jackson et al., 2004; Tu et al., 2000; Xia et al., 2021) Many smokers believe that smoking cessation is just a game of the mind and that willpower is sufficient or necessary for quitting. (Chean et al., 2019) On the other hand, despite the well-documented evidences, most participants expressed that pharmacotherapy was ineffective. (Chean et al., 2019) Despite their limited knowledge about smoking cessation services, some smokers reported that smoking cessation was a

minor, personal issue, and therefore seeking help from official services was unnecessary. (Xia et al., 2021) As for the "quitting is painful" belief, believing that quitting is very hard or almost impossible was the most common reason for not wanting to quit. (Do et al., 2020) For those who attempted to quit, the process was described as painful, both physically and psychologically. It also led to a sense of loss and loneliness. Smoking is a friend—a loss if you give it up. (Tu et al., 2000) Researchers also observed mixed expressions of both enjoyment and worry and even discomfort in old smokers (Spigner et al., 2005), suggesting the dual-pain of both smoking and quitting. This twisted state of mind is without doubt a suffering result of nicotine addiction.

The next theme is "the right to smoke". Some smokers have chanted that smoking is an individual freedom and that smoking is not illegal, so there should not be policies regulating its use. (Ma et al., 2008) Clearly, there are two issues at hand. One concerns the rights of smokers, the other concerns the rights of non-smokers. For the rights to be well established, there is a clear need for a better understanding of the causality of smoking and second-hand smoking on health. The abundant evidence has led to a well-established legal and ethical basis for smoking bans in public places. (Byrd et al., 1989; Oriola, 2009) Therefore, the right to smoke belief is gradually diminishing among smokers.

The last theme is made-up health beliefs. Perhaps the most recent and popular made-up health belief is regarding smoking and COVID-19. Mao et al. surveyed 1,388 adult smokers (95.7% were male) in China three months after the initial outbreak of the COVID pandemic in 2020 and found that about 1 in 10 smokers believe that *smoking can prevent COVID-19* and *cigarette smoke is helpful in killing the virus of COVID-19*. As many as 32.1% of smokers disagree that fine particles produced by smoking may increase virus spread, and 6.8% disagree that smoking is a barrier to COVID-19 prevention. As high as 81.8% of smokers have at least one incorrect belief among the four statements regarding smoking and COVID-19. (Mao et al., 2020) This is a clear demonstration of how smokers could relate to their contextual factors and make up support claims to make their smoking behaviors more rational. Another piece of evidence was found in a study investigating 5,032 long-time male Chinese smokers living in a building with a lung cancer patient. (Lin & Sloan, 2015) The authors found that smokers were much more likely to report that lung cancer was "definitely" more likely and the link between smoking and a set of heart disease and stroke is weaker than between smoking and lung cancer and other respiratory diseases (Lin & Sloan, 2015), which supported this phenomenon that smokers are good at making up health beliefs regarding smoking's health consequences.

2.4 Limitations and conclusions of the literature review

Our literature review aims at achieving a working knowledge base about the most prominent themes in the lay beliefs of smokers rather than being inclusive, so the databases we searched were only PubMed and CNKI. However, because PubMed is one of the most widely used search tools in the biomedical and life sciences, with coverage of 70.9% of all included publications and 82.8% of included studies (Frandsen et al., 2019), we are confident that our review has captured the most important themes on this topic in English literature. There were few papers from the Chinese database, and they were all about Chinese smokers. Since the English literature has already covered Chinese smokers, these papers were being reviewed to confirm the findings. This has caused an overrepresentation of Chinese smokers. The second limitation is that some important countries were not included in this review, including Indonesia, a country with the world's highest male smoking rate. Lastly, the quality of the studies was not rigorously evaluated using established frameworks, which could lead to potential biases. Nevertheless, during our review, we have accumulated a reasonably sufficient understanding of "what" the common misbeliefs and attitudes are, which is our primary goal for this review.

In summary, our literature review on 21 papers from 1999–2021 on the common beliefs and attitudes of male smokers in east and southeast Asian countries aligned with

the six-domain rationalization belief framework developed by Huang et al. for Chinese male smokers. The six rationalization beliefs are: (1) smoking functional beliefs; (2) risk generalization beliefs; (3) social acceptability beliefs; (4) safe smoking beliefs; (5) self-exempting beliefs; and (6) "quitting is harmful" beliefs. Besides those rationalization beliefs, other popular beliefs or attitudes include "smoking is good for health", "fatalism", "quitting is painful", "no need for support", "the right to smoke" and other made-up health beliefs. Because of these similarities among adult male smokers in the East and Southeast Asia regions, we may potentially utilize the rationalization belief scale developed for Chinese smokers (Huang et al., 2020) to reach more populations globally.

3. Method

3.1 Study Design

Because our primary goal of this study is to conduct a pre-intervention situation analysis to improve the design and delivery of the intervention for the subsequent pilot test, we believe the qualitative research method is the most appropriate approach. Specifically, we chose the thematic analysis method because it minimally organizes and describes the dataset in rich detail. (Braun & Clarke, 2006) The themes that naturally emerged and developed during the conversation will be compared with themes identified in the literature review to ensure the validity of our evidence base. The qualitative study included in-depth interviews with two distinct groups of key informants: smokers and community workers. Before carrying out the study, the study plan was consulted and confirmed by three external experts in the tobacco control field.

3.2 Setting and sample

Our qualitative study was conducted in Shanghai, China between May 2022, and July 2022. Participants were recruited via a purposive non-probability sampling technique. For interviews with community workers, participants were recruited by recommendations from the local government based on our preset criteria. All of them are full-time government employees. For interviews with smokers, subjects were selected based on certain characteristics, including age, years of smoking, and

educational level, since these factors were considered most relevant to smokers' perceptions. smoker participants were recruited from two channels. One channel was through the database of communities in Qingpu District in Shanghai, where the community workers regularly interact with residents. Most participants were recommended by community workers. The other recruitment channel was through the database of a previous lung cancer screening project that was conducted by one of our team members that collected information about 1,003 smokers living in this area. Our original plan was to recruit twenty smokers and fourteen community workers for twenty interviews and two focus groups. However, due to the tightened COVID-19 pandemic control measures by the local government, we had to cancel all offline focus groups because social gatherings were temporarily banned. We were advised by community workers that an online focus group was not feasible because most smokers would not be willing to speak up and they may have privacy concerns. Therefore, we were not able to convene any focus groups online either. In addition, we had to change all the offline interviews to an online format. To capture the facial or expressional cues, subtle gestures, and small movements, we require participants to turn on cameras and to take the interview in a place with good Wi-Fi signals. With the new plan, we reached out to twenty potential targets, and four smokers declined to participate, and three were not

responsive. In the end, thirteen smokers and five community workers accepted our interview invitations.

3.3 Data collection

Five community workers and thirteen smokers were interviewed by a team of four researchers. One researcher (male, RW) has about 10 years of working experience in the tobacco control area. One researcher (female, BLY) is a second-year graduate student in the global health program. The other two researchers (one male, YCF, and one female, ZXZ) are undergraduate students majoring in global health. Prior to the interview, the team hosted meetings to coordinate responsibilities and to familiarize themselves with the interview process. At least two researchers were present for each interview, most of the time three. The experienced researcher acted as the principal interviewer. The other person worked as a notetaker and observer. If there were a third person, one person would be the notetaker and the other an observer. The role of the interviewer is to encourage the interviewees to explore the topic thoroughly with intense probing questions for deeper meaning and understanding of the responses. The role of the notetaker is to keep a record of any noteworthy information before, during, and after the interview. The role of the observer is to focus on the facial or expressional cues, subtle gestures, and small movements that might deepen or contradict his words. The whole interview was videotaped after obtaining verbal consent from the interviewees. Before

the interview, a signed Informed Consent Letter was obtained and verbally verified at the beginning of each interview. After each interview, the researchers combined the notes and observations within 24 hours, and a case summary was written and uploaded to the cloud space. If any important information was later collected, researchers were free to add it to the shared document.

The interviewer followed an interview guide to facilitate deeper discussion while keeping the topic pertinent. (See Appendix B: Qualitative Interview Guide). The guide is consistent with our aims of study and was purposefully made into a semi-structured format. It allowed us to explore via open questions their personal history, opinions, attitudes, and feelings. The initial question was an open-ended question asking about the smoker's personal experience of picking up the first cigarette. This will allow them to reflect and to express values in their own words by talking about their personal stories. The following questions were either dependent on the responses of the participants or predetermined in the interview guide. As the interview develops, we constantly check if our target has expressed any rationalization beliefs that fall into the six domains of the smoking rationalization framework. The left-over items in the framework will be brought up and specifically mentioned to elicit interviewees' feedback. To avoid misunderstanding, questions were sometimes phrased in a way to get lengthy, detailed answers from participants. We also included the questions regarding broader tobacco

control policies to understand the social and environmental factors that contextualized their current state of mind. Questions on the interview guide were reviewed and agreed upon by all researchers to ensure they were unbiased and easy to understand.

The interviews were conducted in Mandarin Chinese except for one older participant, who spoke a local Shanghai dialect. One researcher (YCF) was a local Shanghainese, so he was the principal interviewer for this specific interview. Each interview lasted about 30–80 minutes. The interviews were audio-recorded and transcribed verbatim. The transcriptions were proof-read by other researchers to ensure fidelity. After the interview, a RMB100 cash remuneration was provided to smoker participants and a RMB200 cash remuneration to community workers participants.

3.4 Data analysis

Data was anonymized by assigning a unique identifier to each interviewee. Two researchers (RW & YCF) started line-by-line open coding independently to ensure a comprehensive and inductive analysis. Coders exchange views regularly to discuss any discrepancies in coding and collectively developed sub-themes and themes. We used an inductive analysis approach because inductive content analysis is used in cases where there are no previous studies dealing with the phenomenon or when it is fragmented. (Pearse, 2019) If codes were fragmented, we use the techniques of constant comparison, continual checking, and clustering of emerging themes to formulate a theoretical

framework. (Glaser, 1978) After we did the analysis for the respective groups, we compared the results of the smokers with findings from literature review and with those of the community workers to see if there were any gaps. Data from one interviewee was excluded for further analysis since the interviewee (Participant S13) mumbled his words all the time so that no clear message could be extracted. All the remaining seventeen interviews were analyzed using NVivo Pro 12.6.

4. Results

We interviewed eighteen participants. Table 4 shows the demographic characteristics of the participants in detail. In our study, we narrow the meaning of *belief* to a set of perceptions that are closely related to behaviors that can be distinguished as right or wrong (*misbelief*) by applying reasoning or common sense. Attitude and feelings are defined as internal interpretations and emotional expressions derived from personal moral principles, which are more closely related to an individual's inner traits or life philosophy. Obviously, there's no right or wrong attitude or feeling. Compared to *attitudes* and *feelings*, *beliefs* may be comparatively easier to change by good communication and appropriate external interventions.

In summary, we have identified all six domains of the rationalization belief scale in our smoker interviewees, including *smoking functional beliefs, safe smoking beliefs, self-exempting beliefs, social acceptability beliefs, risk generalization beliefs,* and *"quitting is harmful" beliefs*, although the weight of each domain is distributed slightly differently from our earlier finding in the literature review. In addition to the misbeliefs, our smoker interviewees also demonstrated several salient attitudes and feelings regarding smoking and quitting. Smoking-related themes are *fatalism* and *family matters*. Quitting-related themes are *no need for help*, *indifference and pessimism*, and "I *can quit when I decide.*" As for community workers, they believe *the environment is the biggest factor for smoking*

and that *leadership support is crucial*. They hold *mixed attitudes regarding cessation clinics* and believe *individual willingness matters*. They also pointed out a few major barriers to smoking cessation efforts, including *lack of resources, lack of acceptability and compliance from smokers, lack of methods to deal with physical addiction,* etc. Table 5 summarizes our major qualitative themes of the beliefs, attitudes, and feelings of smokers and community workers.

Table 4: Demographic Characteristics of Participants (n=18)

	Smokers (n=13)	**Community Workers (n=5)**
Age, year, mean (SD),	45.2 (12.0)	46 (5.3)
Range	34-77	38-50
Gender		
Male	100%	0%
Female	0%	100%
Education Level		
Below college	5 (38.5%)	0 (0)
College & above	8 (61.5%)	5 (100%)
Smoking years, mean (SD)	21.23 (9.4)	
0-19	5 (38.5%)	
20 and above	8 (61.5%)	
Quitting attempt		
Yes	12 (92.3%)	
No	1 (7.7%)	

Table 5: Summary of Qualitative Themesof the Beliefs, Attitudes, and Feelings of Smokers and Community Workers

Population	Construct	Theme	Frequency, N (%)	Illustrative quotations
Smokers	Beliefs	Smoking functional	11 (91.7)	*Smoking has many benefits. For example, if two men do not know each other, give him a cigarette, and you are friends! (Participant S10)*
		Safe smoking	11 (91.7)	*The trick is not to exceed the extent. I know it's harmful, but I control the amount to the degree that my body can tolerate. So, I believe I can smoke without concern within this limit.* (Participant S4)
		Self-exempting	9 (75.0)	*After the annual physical check-up, they found a tiny node in my lung. I comfort myself that there are many non-smokers who have bigger nodes. Mine is no big deal.* (Participant S11)
		Social acceptability	8 (66.7)	*When I am with friends drinking liquor, others often give you a cigarette to show respect. You lose your face if you don't accept it.* (Participant S1) *When I knew my friend was quitting, I intentionally seduced him to smoke. I know it's wrong, but I don't want to see him succeed.* (Participant S3)
		Risk generalization	6 (50.0)	*You girls love eating unhealthy snacks, and we boys love smoking. It's for the same reason.* (Participant S10) *Smoking is, after all, a personal habit, not a disease.* (Participant S4)
		Quitting is harmful	5 (41.7)	*One of my colleagues quit smoking and then gained weight in just two months. He felt he was more likely to catch a cold after gaining weight. So, he picked up smoking again.* (Participant S10)
	Attitudes & Feelings (smoking)	Fatalism	9 (75.0)	*It doesn't matter to me at all. If I get cancer, I get cancer. We need to seize the moment and enjoy the moment!* (Participant S2) *When I grow older, I feel life is just like that (we can't control it). So, I have become less harsh on myself, and I smoke when I want to.* (Participant S3)
		Family matters	5 (41.7)	*I can't smell it, but my kid said it's a bad smell, so I never smoke in front of him. I recently switched to e-cigarettes, primarily because they're smokeless and will affect others less.* (Participant S11)

Table 5: Summary of qualitative findings (continued #2)

Population	Construct	Theme	Frequency, N (%)	Illustrative quotations
Smokers	Attitudes & Feelings (quitting)	No need for help or being skeptical	11 (91.7)	*Smoking cessation clinics? Chewing gums? I don't believe in these things. If you need these, you are just changing your subject from being dependent on smoking to being dependent on those measures!* (Participant S5) *(To quit) You will need to change your thoughts. It's just pointless to have any external support.* (Participant S8)
		Indifference and Pessimism	6 (50.0)	*Once you are used to something, when it is no longer there, you feel it is not right. Even if you don't want to pick up smoking, others (smokers) will remind you. The result will not be different: you will continue smoking.* (Participant S10) *I never pay attention to the "smoking is harmful" warning message on cigarette packs. No smokers would. I can't quit, so why bother?* (Participant S5)
		I can quit when I decide to	6 (50.0)	*Come on, smoking is not like drug addiction. Any adult can quit when they want to do so.* (Participant S11) *If one day I decide (not to smoke again), I am sure I can do it. Okay? I just quit.* (Participant S3)
Community Workers	Beliefs	Environment is the biggest factor for smoking	5 (100.0)	*Smoking definitely has much to do with the working environment. Nowadays, the older generation is following the younger generation in quitting smoking because smoking is banned at their workplaces.* (Participant CW2)
	Attitudes & Feelings	Leadership support is crucial	4 (80.0)	*If government leaders do not show strong support, it would be very difficult for me to push it forward.* (Participant CW4)
		Mixed attitude regarding cessation clinics	3 (60.0)	*I believe we need smoking cessation clinics because some smokers do need professional support to quit smoking.* (Participant CW1) *To go to the hospital to quit? I don't think it works here in the rural areas.* (Participant CW4)

Table 5: Summary of qualitative findings (continued #3)

Population	Construct	Theme	Frequency, N (%)	Illustrative quotations
Community Workers	Attitudes & Feelings	Individual willingness matters	3 (60.0)	*I believe quitting has much to do with personal will. I believe they (smokers) have a psychological addiction... I know a few smokers who have quit successfully. They have determined not to smoke any more. Their quitting process is much smoother.* (Participant CW4)
	Barriers	lack of resources	5 (100.0)	*We don't have the (smoking cessation) clinic, the medication, nothing. If a smoker came to me today, I could only offer him some advice. We don't have anything available and effective to offer him.* (Participant CW3)
		lack of acceptability and compliance from smokers	4 (80.0)	*At first, everyone was supportive. Later, smokers left gradually. We don't know why. Finally, there were just a few people participating. (The tone is disappointing)... I feel my head will explode because I have urged them (smokers) so many times to fill out the simple forms. They just ignored me completely.* (Participant CW2)
		lack of methods to deal with physical addiction	2 (40.0)	
		weak law enforcement	2 (40.0)	
		lack of leadership	1 (20.0)	
		lack of incentives and restrictive financial regulations	1 (20.0)	
		lack of role model	1 (20.0)	
		social stigma	1 (20.0)	
		lack of efforts	1 (20.0)	

4.1 Smokers' Beliefs

4.1.1 Theme 1: Smoking functional beliefs

Eleven out of twelve smokers had smoking functional beliefs. They believe smoking can bring various benefits or utilities to them. The most prevalent belief is that "smoking is good for social interaction."

Smoking has many benefits. For example, if two men do not know each other, give him a cigarette, and you are friends! (Participant S10)

It doesn't matter whether I have quit smoking or not. Smoking is a useful social tool. So long as I am out meeting people, I will put some cigarettes in my pocket just in case. (Participant S1)

Smoking has a very important function, and that is socializing. When my client comes, I must give him a cigarette to make him feel close to me. (Participant S2)

Other benefits (in decreasing prevalence order) are reducing stress, eliminating fatigue, being good for inspiration, and killing time. About half of smokers believe that smoking lowers their stress level.

All my longings to smoke come from my work stress. It propels me to smoke (to alleviate it). (Participant S10)

When I come across some stress in my life or work, I can't help but pick up the cigarettes again. (Participant S3)

I had to spend a lot of time searching for materials every night. I felt so tired and sleepy. But after I smoked, I felt that was okay. (Participant S2)

One of the good things about smoking is that, for example, when I was drafting a report and needed to use my brain, I could use the cigarette to make me think. (Participant S1)

When you are alone or bored, you immediately think of smoking to pass the time and believe there is no need to quit. (Participant S3)

Three sub-themes that were not in the smoking rationalization scale (Huang et al., 2020) but that emerged in our research were: being patriotic, good for health, and having a good image. However, the "smoking is being patriotic" belief was only frivolously mentioned by three smokers. One smoker acknowledged that he had such a belief and then added that he did not seriously think so.

(After concurring with the view that smoking is good for economic development,) when smokers talk about how smoking is good for national defense, they are just joking! No one seriously thinks so. (Participant S11)

I don't have such a big vision that smoking is making a contribution to national development. I do hear smokers joking about that! (Participant S1)

One smoker mentioned that "smoking is good for health" because he believes smoking can dehumidify the air since "*after all, the lighted cigarette is a warm thing in hand*" (Participant S8), which is good for health.

One smoker mentioned that when he was young, he believed "*smoking was cool and gave him a good image*" (Participant S10). He conceded that he no longer holds such a view now.

4.1.2 Theme 2: Safe smoking beliefs

Eleven out of twelve smokers believe that they can reduce the harm of smoking by doing something on their own, such as smoking for a shorter period of time or not inhaling the smoke into their lungs. But many smokers stress that it depends on the degree. You must control the degree, and it is often hard to do so.

The trick is not to exceed the extent. I know it's harmful, but I control the amount to the degree that my body can tolerate. So, I believe I can smoke without concern within this limit. (Participant S4)

I feel that the cheaper the cigarette is, the more harmful it is. Premium cigarette brands like Soft China and China Brand are definitely better because they have better filters. They are comparatively less harmful. (Participant S5)

4.1.3 Theme 3: Self-exempting beliefs

Six out of twelve interviewees express the self-exempting belief that they "haven't experienced the harm yet". Three smokers expressed the belief that "they are immune from the harm" and two smokers believed that "there's insufficient evidence

about the harms of smoking". One smoker agreed that "I can smoke means I am healthy," and one smoker believes that "smokers often live longer than non-smokers."

As a manager, I got to see the physical reports of many people. Every year there are many abnormalities, but I never thought it would be me. (Participant S1)

After the annual physical check-up, they found a tiny node in my lung. I comfort myself that there are many non-smokers who have bigger nodes. Mine is no big deal. (Participant S11)

When you tell a 30-year smoker that smoking will cause lung cancer, he will feel that you are cursing him! Everyone believes that getting cancer is a small probability and it would never happen to me. (Participant S3)

4.1.4 Theme 4: Social acceptability beliefs

Social acceptability beliefs mean smoking is a social norm and disobeying such a norm can lead to social sanctions. A majority of smokers express the view that "it is hard to be different".

When I am with friends drinking liquor, others often give you a cigarette to show respect. You lose your face if you don't accept it. (Participant S1)

My colleagues often gave me cigarettes, and I never turned them down. (Participant S2)

The second most prevalent sub-theme is forming a small circle. Smoking gives smokers a special sense of bonding. Smokers frequently described themselves as a small

group of bad boys, rather than with pride. They clearly know such behavior is bad, but they enjoy the sense of being bad together in brotherhood.

(As a teacher) My school has regulations on smoking. Four of my colleagues often call each other to go smoking together. We never answered each other's calls because when we saw the call came, we would know the message and would go to unite with the others immediately. We can read each other's minds! (Participant S3)

When I knew my friend was quitting, I intentionally seduced him to smoke. I know it's wrong, but I don't want to see him succeed. (Participant S3)

Other sub-themes that have been mentioned include "it's normal for men to smoke," "famous people smoke," and "doctors smoke." It is interesting to note how the fact that tobacco is a state-owned enterprise in China has led to fabricated smoking beliefs among Chinese smokers.

I am talking about the environment. If the country (China) really believed that smoking is so harmful that it does not have any benefits, then why does the government still allow cigarette sales? (Participant S3)

Everyone knows that smoking is harmful. However, the country (China) only puts "smoking is harmful" on the cigarette packs, but there are no stronger measures. It is unlike the COVID pandemic. They know it is definitely harmful, so they are much more resolute about the control policy. (Participant S9)

4.1.5 Theme 5: Risk generalization beliefs

Some smokers generalize the risk of smoking to some common, lower-risk factors to make smoking seem normal and less harmful. For example, one smoker said:

You girls love eating unhealthy snacks, and we boys love smoking. It's for the same reason. (Participant S10)

Despite the fact that the district of Qingpu is a suburb of Shanghai that enjoys large forest coverage, one smoker attributed the increasing cases of lung diseases to air pollution:

I feel in recent years the air quality has not been good. That's why there are so many lung cancer cases in this district where I live. (Participant S11)

Another new sub-theme, "smoking is not a disease" was identified by our study. Smokers tend to ascribe smoking to a personal habit rather than a disease (substance abuse disorder), which lowers their awareness of its potential harm.

To me, I don't think smoking is a disease. It is just a kind of psychological dependence that may come back to normal with a bit psychological support or auxiliary treatment. (Participant S3)

Smoking is, after all, a personal habit, not a disease. (Participant S4)

4.1.6 Theme 6: “Quitting is harmful” beliefs

"Quitting is harmful" beliefs were identified as one of the most popular misbeliefs in the study of Huang et al. (Huang et al., 2020) However, it was a minor theme in our study. The misbeliefs are centered around quitting symptoms and how they lead to failure to quit. Smokers tend to borrow examples from others rather than speak up about their own feelings.

One of my colleagues quit smoking and then gained weight in just two months. He felt he was more likely to catch a cold after gaining weight. So, he picked up smoking again. (Participant S10)

Old smokers believe if I don’t smoke, my health could be worse and other diseases might emerge. But if I smoke, this is the only problem for me to deal with. (Participant CW3)

4.2 Smokers’ attitudes and feelings regarding smoking and quitting

Our study has revealed the following themes regarding smokers’ attitudes and feelings regarding smoking and quitting: The smoking attitudes are centered on *fatalism* and *family matters*. The quitting attitudes are centered on *no need for help, indifference and pessimism*, and "*I can quit when I decide.*"

4.2.1 Theme 1: Fatalism

Fatalism was an attitude of indifference to risk while smoking. Many smokers from Southeast Asian countries report having fatalistic beliefs. (Lafferty et al., 1999; Lee et al., 2009) We also observed strong fatalism from smokers in our interviews. Such a belief may also be described as the life philosophy of "carpe diem" (seize the day).

It doesn't matter to me at all. If I get cancer, I get cancer. We need to seize the moment and enjoy the moment! (Participant S2)

When I grow older, I feel life is just like that (we can't control it). So, I have become less harsh on myself, and I smoke when I want to. (Participant S3)

4.2.2 Theme 2: Family matters

Nearly half of the smokers interviewed expressed the idea that they only smoke when they are not with their loved ones. They characterize themselves as loving fathers who are caring and mindful of others.

I can't smell it, but my kid said it's a bad smell, so I never smoke in front of him. I recently switched to e-cigarettes, primarily because they're smokeless and will affect others less. (Participant S11)

The rule is that when my family is at home, I never smoke. (Participant S10)

4.2.3 Theme 3: No need for help or being skeptical

Eleven out of twelve smokers, no matter their quitting experience, have either not heard about quitting support or voiced consensus that there's no need for such support. For those who heard about it, they were skeptical about the effectiveness of quitting support. One smoker said the reason is that he wants to avoid being judged by others if he fails. He'd rather no one knew. However, one smoker said he believes intervention is needed.

Smoking cessation clinics? Chewing gums? I don't believe in these things. If you need these, you are just changing your subject from being dependent on smoking to being dependent on those measures! (Participant S5)

(To quit) You will need to change your thoughts. It's just pointless to have any external support. (Participant S8)

4.2.4 Theme 4: Indifference and Pessimism

Among the smokers who have failed to quit, we observed a prevalent attitude of indifference and pessimism. In fact, half of smokers have expressed that quitting is so difficult because it is just so hard to change and that they might never be able to quit smoking. Some have blamed their psychological addiction; some have given up trying and diverted their attention to other matters. This attitude inevitably leads to negative feelings such as sadness, loss, and helplessness.

Once you are used to something, when it is no longer there, you feel it is not right. Even if you don't want to pick up smoking, others (smokers) will remind you. The result will not be different: you will continue smoking. (Participant S10)

I never pay attention to the "smoking is harmful" warning message on cigarette packs. No smokers would. I can't quit, so why bother? (Participant S5)

Sometimes, when I smoke too much, I feel sick. I thought of not smoking the next day. But I knew it was just a thought. I can't help but smoke again. (The tone is sad) (Participant S9)

Quitting is just a flash of mind. Some can get it, and they immediately quit once and for all. But I am not one of them! …I tell you, there is no way I can get a cigarette during the COVID-19 lockdown. It is true! I *had to tough through! tough through! (The tone is helplessly angry)* (Participant S2)

4.2.5 Theme 5: I can quit when I decide to

Interestingly, contrary to the pessimistic attitude above, we noticed an equally large portion of smokers feel rather confident that they can quit once they decide to. They'd like to go with the flow so that when the time is right, they will just quit once and for all. However, when the harms were presented, some adapted with a cautious attitude by smoking less, rather than quitting completely. This attitude was often compounded by positive feelings such as having fun, being cool, feeling satisfied, etc.

Come on, smoking is not like drug addiction. Any adult can quit when they want to do so. (Participant S11)

If one day I decide (not to smoke again), I am sure I can do it. Okay? I just quit. (Participant S3)

He gave me a cigarette, and we ended up having great fun together. (Participant S7)

4.3 Community workers' beliefs, attitudes and feelings

We interviewed five community workers. One is a physician doctor working at community clinics. Three have managerial responsibilities, and one is a frontline worker. All community workers have tobacco control related job responsibilities and they have covered a wide range of tobacco control practices, including assisting law enforcement, organizing lectures and health promotion events, carrying out health promotion projects, offering incentives and technological support, case sharing and collection, training, setting up helplines etc.

4.3.1 Theme 1: The most important factor in smoking is the environment.

All community workers expressed the belief that environmental factors have the biggest impact on smoking. In particular, they believe micro-environmental factors such as family and the workplace have a bigger impact on smoking than macro-environmental factors at a societal and national level. Most of them are optimistic about macro-environmental changes such as smoking bans, health promotion, and so on, and

believe that tobacco control goals can be met in the long run. Some of them feel frustrated that the change at local level is too slow, and they lack sufficient support, resources, and channels to change the micro-environments of smokers.

Smoking definitely has much to do with the working environment. Nowadays, the older generation is following the younger generation in quitting smoking because smoking is banned at their workplaces. (Participant CW2)

It's like the garbage classification campaign. At first, no one believed this campaign could be successful. It caused us much inconvenience. But the government was determined and dedicated many resources to it. Then the whole society just changed to follow suit. I believe smoking control should be just like this. (Participant CW2)

4.3.2 Theme 2: Leadership support is crucial

Four out of five community workers stressed that leadership support is crucial for any smoking cessation project to be impactful. They referred to leadership as leadership from government rather than opinion leaders or private industry leaders. They believe the show of support by government leaders will not only ensure smooth participation from community workers (some of them are government employees) but also encourage participation from smokers since it means the project has an official endorsement, which is much more trustworthy.

If government leaders do not show strong support, it would be very difficult for me to push it forward. (Participant CW4)

I think one thing is quite important. You must obtain the endorsement from our party secretary. And our party secretary should be supported by the major leaders of the local (district) government. (Participant CW5)

4.3.3 Theme 3: Mixed attitudes regarding cessation clinics

Two community workers believe that smoking cessation clinics are needed. One believes they are not very helpful.

I believe we need smoking cessation clinics because some smokers do need professional support to quit smoking. (Participant CW1)

We don't have smoking cessation clinics here. It seems there are some obstacles. But I believe it is actually very important. I know many older people who have comorbidities and would want to quit. (Participant CW3)

To go to the hospital to quit? I don't think it works here in the rural areas. (Participant CW4)

4.3.4 Theme 4: Individual willingness matters

Three community workers mentioned that quitting is largely decided by an individual's willingness. One suggested we should have a scientific way to separate people with high dependence levels from casual smokers. They believe the success of

quitting is primarily due to their determination. They ascribed addiction more to psychological addiction than to physical addiction.

I believe quitting has much to do with personal will. I believe they (smokers) have a psychological addiction... I know a few smokers who have quit successfully. They have determined not to smoke any more. Their quitting process is much smoother. (Participant CW4)

4.3.5 Barriers to smoking cessation efforts

The following barriers were mentioned by community workers in prevalence order: lack of resources; lack of acceptability and compliance from smokers; lack of methods to deal with physical addiction; lack of leadership; lack of incentives and restrictive financial regulations; and weak law enforcement. Minor barriers were lack of role models, social stigma, and lack of effort.

We don't have the (smoking cessation) clinic, the medication, nothing. If a smoker came to me today, I could only offer him some advice. We don't have anything available and effective to offer him. (Participant CW3)

At first, everyone was supportive. Later, smokers left gradually. We don't know why. Finally, there were just a few people participating. (The tone is disappointing)... I feel my head will explode because I have urged them (smokers) so many times to fill out the simple forms. They just ignored me completely. (Participant CW2)

4.4 Comments and Reflections on the CCeSCI

We used the ten-principle framework on how to design, implement, and evaluate organizational interventions developed by Schwarz et al. (von Thiele Schwarz et al., 2021) to summarize our findings and reflections. The ten-principle framework was chosen because it fits our setting quite well. CCeSCI was developed to incorporate supply-side intervention with the goal of achieving not only individual health impact but also organizational and societal impact. Also, the principles include the three-phase consideration of design, implementation, and evaluation in a way that maximizes both practical and scientific impact. The ten principles are:

1) Ensure active engagement and participation among key stakeholders

2) Understand the situation (starting points and objectives)

3) Align the intervention with existing organizational objectives

4) Explicate the program logic

5) Prioritize intervention activities based on effort-gain balance

6) Work with existing practices, processes, and mindsets

7) Iteratively observe, reflect, and adapt

8) Develop organizational learning capabilities

9) Evaluate the interaction between intervention, process, and context

10) Transfer knowledge beyond the specific organization

We summarized the comments from both community workers and smokers in Table 6. Researchers' reflections were also included based on those comments. Regarding the overall program rating, we define "positive" as an explicit expression of praise or fondness; being confident and/or optimistic about the outcome; and being eager to participate in the program. We define "neutral" as being hesitating in giving feedback, such as mentioning "I don't know," "it's still too early/hard to say" or "I would like to wait and see how it goes." We define "negative" as posing a criticizing or opposing attitude, or an explicit or implicit expression of any kind of disapproval. Based on these definitions, the CCeSCI was rated "positive" by 7/12 (58.3%) smokers, "neutral" by 4/12 (33.3%) smokers, and "negative" by only one (8.3%) smoker. As for community workers, 4/5 (80%) of them gave us "positive" ratings and only one (20%) gave us a neutral rating. The non-positive ratings tend to be concentrated on smokers who hold fatalism and pessimism as their attitudes. Due to time constraints, we gave each participant an approximately 5-minute brief introduction. We believe insufficient or incorrect understanding of the content also negatively impacted the rating.

Table 6: Summary of Comments and Reflectionson the Community Centered eHealth Smoking Cessation Intervention (CCeSCI) from Smokers, Community Workers and Researchers based on the Ten-principle Framework on how to Design, Implement, and Evaluate Organizational Interventions

Principle	Design	Implementation	Evaluation	Illustrative quotation
Ensure active engagement and participation	Make eHealth technology more acceptable to smokers	Ensure communications with participants are frequent and appropriate	Use incremental measurement for performances rather than Yes or No	*Some smokers are old in age and low in education level. Some don't have smartphones. Some will not use even you give him a free device.* (CW1) *Smokers may feel bored if your message is the same as before. I think you should start from smokers with good education.* (CW5)
Understand the situation	Design personalized program based on smokers' individual need and involve participation from community	Identify exemplary community workers and facilitate case-sharing	Evaluate if perception gaps are narrowed via interviews	*This (CCeSCI) intervention sounds better than the previous project because it is more personalized. You will need participation from the community.* (CW2) *They (smokers) do not need more knowledge. They need practical and effective cessation services.* (CW4)
	Do not include the pharmacological intervention since it is not well accepted	Focus on the messages from former smokers rather than physician doctors		*I think it is best that the message is told by a former smoker rather than a doctor. Video is much better than text or poster.* (S4) *It is much more persuasive to have a former smoker.* (S11)
		Have accompany with smokers through the whole process		*If you really want to help people quit, you must know that it is not a one-time or two-time thing. Smokers will need to be accompanied.* (S2)

Table 6: Comments and reflections on the CCeSCI (continued #2)

Principle	Design	Implementation	Evaluation	Illustrative quotation
Align the intervention with existing organizational objectives	Align intervention goals with government strategy	Frequent regular progress report to ensure leadership the program is on track	Use metrics compatible with official report	*This project is best to be integrated into the Yangtze River Delta Integration plan, which is the priority for the local government.* (CW4)
Explicate the program logic	Ensure the mechanisms of action will work across the whole process of quitting, including the follow-ups	Engaging monitoring from family and friends. Keep track of unexpected results.	Measure contextual improvement (e.g. better family relations)	*Can you make sure it works from the beginning to the end?* (CW1) *I think if you asked the family to monitor, it might be more effective.* (S1)
Prioritize intervention activities based on effort-gain balance	Emphasizing community worker training over eHealth function development	Give up minor improvement with big investment	Outcome oriented, focus evaluation on how efforts of community workers have brought change	
Work with existing practices, processes, and mindsets	Avoid using an academic mind to communicate Avoid talking too much on harms of smoking	Encourage smokers to find another habit that they like, such as sports Respect smokers' privacy. Make F2F visit only with permission Consider COVID-19 policies before F2F visit	Use the culturally adapted rationalization belief scale to measure and follow-up	*It is unnecessary to talk about the harms of smoking because everyone already knows.* (S3) *I believe the face-to-face meetings should not be too frequent. Smokers don't want others to know.* (S4) *It is very troublesome to pay a visit to the community center because they will need to scan the health code.* (S5)

Table 6: Comments and reflections on the CCeSCI (continued #3)

Principle	Design	Implementation	Evaluation	Illustrative quotation
Iteratively observe, reflect, and adapt	Build a monitoring system for progress tracking; Form a WeChat group among community workers	Train, monitor and encourage use from participants	Use backstage data collection to measure interactivity	
Develop organizational learning capabilities	Aim at empowering the overall skills of community workers	Discover role models who are enthusiastic about and good at promoting knowledges	Conduct interviews with supervisors, peers and subordinates to evaluate skill maturation	*The old ladies in communities are sometimes better than the experts. They are very good at translating your language into the languages of the locals.* (CW5)
Evaluate the interaction between intervention, process, and context	Have separate measurements for smokers and community workers	Observe and document how behavioral intervention interacts with cognitive intervention	Try to develop an approach to evaluate effectiveness of different intervention elements	
Transfer knowledge beyond the specific organization	Aim at forming a strategy to match resources with smokers' different needs	Record learnings during implementation to inform future interventions	Refine dissemination plan to include multiple channel including social media for greater social impact	

Note: Blue areas are comments from community workers. Green areas are comments from smokers. Yellow areas are reflections by researchers that have either already been included in the CCeSCI protocol or are under consideration to be included in the future.

4.5 Differences and Similarities between groups

During the analysis, we found that although we used similar interview guides, the following differences and similarities in the feedback from smokers and community workers are noteworthy.

Regarding beliefs, the six rationalization beliefs naturally emerge but are not clustered. Smokers have varied sets of rationalization beliefs that are highly different from each other. As for community workers, they just generally acknowledged the rationalization beliefs among the smokers they knew and attributed smoking more to environmental factors rather than individual beliefs. They recognized the importance of smokers' individual willingness but did not give much reasoning on how the willingness is related to their specific sets of rationalization beliefs. Rather, they tend to think the government's efforts in tobacco control will help change the landscape and make smokers more willing to quit, regardless of their rationalization beliefs. Plus, they believe it would be very difficult to try to change their beliefs even if we knew them well.

Regarding attitudes, smokers have reached some consensus on fatalism, family matters, and no need for help, but are largely contradictory by their confidence in quitting. However, community workers are more unified by their positive attitudes towards the trend of tobacco control and voiced similar emphasis on government leadership's support. They are largely confident that smoking will decrease, despite data

in recent years indicating some ups and downs. They attributed barriers mostly to lack of resources, which is a changeable condition, and they are not worrying about the future since the government is paying attention to this matter. The only mixed attitude among community workers is regarding smoking cessation clinics. However, their disagreement is only regarding the timing; none has doubted its effectiveness.

In summary, the feedback is consistent and similar within the community worker group but is highly varied among smokers. This indicated a need for personalization in the intervention as well as the possible effectiveness of training.

5. Discussion

Prior to the qualitative study, we developed the CCeSCI, a packaged intervention to assist smoking cessation for adult male smokers in China. We engaged in an iterative formative research process to develop and personalize the validated rationalization belief scale for delivery by non-specialists in a Chinese rural setting based on evidence from literature reviews. A pilot randomized trial is underway to assess the effectiveness of the CCeSCI in smoking abstinence and better engagement with the hard-to-reach adult male smoker population in China (clinicaltrials.gov 22KDKUF016).

During our interviews, we observed agreements between community workers and smokers largely lie on the themes of *willingness to quit* and *family's role*. There were also some notable disagreements. For example, a *lack of methods to deal with physical addiction* is frequently mentioned by community workers as a barrier to quitting, while few smokers believe they have a strong physical addiction. Even pessimistic smokers would attribute addiction to psychological factors, let alone optimistic smokers who believe they can quit whenever they want. Since our interviewees have an average year of smoking as high as 21.23 years, such a misalignment would reveal a general lack of knowledge about nicotine dependence. To investigate the degree of dependence, we have included the Fagerström Test for Nicotine Dependence (FTND) (Heatherton et al.,

1991) in our later pilot trial. It appears that for those hard-to-reach smokers, a more tactical engagement strategy should be something like this: we first approach smokers by catering to their psychological needs. During the intervention, we size our opportunity to measure their physical addiction levels and provide pharmacological treatment options depending on their specific levels of addiction. Over the counter (OTC) smoking cessation products would enable such treatments with no visit to clinics, which smokers mostly avoid. Culturally adapted approaches such as the "coping pebbles" activity (Sikkema et al., 2018) could also be used to help smokers distinguish changeable and unchangeable risks.

Cluster analysis has revealed poor inter-group thematic similarity between community workers and smokers, warranting a more effective communication strategy. Good health communication through village health volunteers, community leaders, family members, and medical health staff can have an impact on quitting smoking. (Seangpraw & Tonchoy, 2019) Latkin and Knowlton recommended health communications should be not only memorable but also sufficiently interesting to become a topic of future conversations—and gossip. (Latkin & Knowlton, 2015) Furthermore, a study has shown community workers with stronger punishment orientations report higher levels of job stress.(Jin et al., 2018) The shifting of community workers' role from smoking ban enforcement would also lead to mental health

improvement among community workers, making this program more acceptable from a supply-side perspective.

Including real-life examples (either positive or negative) has been suggested as a potential method to increase engagement by both community workers and smokers. One interviewee mentioned that traffic accident videos broadcast by law enforcement agencies were quite effective in fostering good driving habits. He suggested we include real-life stories of smokers who had catastrophic diseases. This reminded us about the Tips From Former Smokers (Tips) public education campaign initiated by the United States Centers for Disease Control and Prevention (CDC) in 2012. (Center for Disease Control and Prevention, 2022) According to research, this campaign has had a significant impact on cessation behaviors among adult smokers in the United States over time. (Davis et al., 2018) We had experience of introducing these videos to China, and the viewership was exceedingly high on social media. Similar efforts were made by the Tobacco Control Office of the Chinese Center for Disease Control and Prevention (China CDC) to produce a culturally adapted version of the Tips videos. However, due to the graphic content that violated the *Temporary Regulations on Public Advertisement Promotion and Management* by China's State Administration for Market Regulation (China, 2016), these videos never reached the mass public. CCeSCI may embed these examples in the

training for community workers who can deliver them to smokers through individual-to-individual communications.

Our study revealed a common misconception by policymakers to treat smokers as a single group with shared characteristics. However, smokers are highly different. Evidence has shown clear differences in perceptions due to age (Cohn et al., 1995) and gender (Grunberg et al., 1991; Hermalin & Lowry, 2010; Zanchi et al., 2016). Other demographic factors, such as social economic status, may also contribute to these differences as well. For example, a study has shown that smoking cessation effects are related to the patient's educational level (Ying-qiu Yin, 2018). Since China has more than 300 million smokers (Li et al., 2011), we could imagine how different their individual perceptions might be. Therefore, to address psychological dependence, personalized smoking cessation interventions should be not only preferable but also inevitable. Because of the high internal variability among smokers, public health policymakers should be aware that a one-size-fits-all approach to smoking cessation is doomed to fail.

Reflecting on the prevalent negative attitude against smoking cessation clinic services among smokers and mixed feelings among community workers, healthcare investment in strengthening clinic capacity should be coordinated with its acceptability. Despite the high effectiveness of smoking cessation clinics in quitting smoking (Wu, 2009), the average weekly clinic admission was only 6.92 smokers. (Wang et al., 2015)

The major reason for not visiting clinics was that smokers didn't believe tobacco dependence was a disease. (Wang et al., 2015) In fact, most smokers consider themselves healthy until symptoms emerge. The number of smoking cessation clinics dropped dramatically from 201 in 2010 to 94 in 2015 (Wang et al., 2015) with ups and downs recently in different regions across China. A recent survey found more than one third of hospitals in Shanghai wish to open smoking cessation clinics and many doctors wish to receive tobacco cessation training (Sun, 2019). If smoker acceptability remains low, or if there is no effective and sustainable approach to identifying and directing asymptomatic smokers to smoking cessation clinics, we may see another round of healthcare resource waste, exacerbating the dislocation of resources in a dysfunctional healthcare system.

Lastly, we found some interesting themes related to the COVID-19 pandemic and smoking. Lockdown was cited by smokers both as a reason to smoke and a reason to quit. These contradictory beliefs may be related to smokers' willingness to quit and rationalization belief level. One smoker (participant S1) shared with us a belief he said was prevalent among old smokers: that smoking makes the lungs harder and protects them from being infected by COVID-19 viruses. "*Non-smokers have tender lungs, so that they are more vulnerable.*" This belief echoes findings by Mao et al. (Mao et al., 2020) but our findings provided richer information on their unique reasoning, which can only be captured by qualitative studies.

There are several limitations to our study. First, the sample size is very small. We only interviewed a handful of smokers and even fewer community workers. The originally planned focus groups were not conducted due to COVID lockdown, which would otherwise have supplemented our data to saturation. However, since our study aim was to confirm previous findings and to inform better study design for our pilot RCT, theory generation was not our primary focus. Plus, the dual-observer set-up enabled us to catch richer information during the interviews. We also encouraged our interviewers to take whatever time they needed to speak, so that the average length of interviews was longer than originally expected. Second, the interviewees were conducted just one month after a major citywide lockdown in Shanghai. The result might be biased due to the repercussions of the dramatic measures taken during the lockdown. Also, we were not able to find any male community workers for the interviews. Though a survey has shown female community workers took a dominant share of 85% and were mostly aged 35–45 (Anonymous, 2012), which our samples fell into, this limitation did narrow the representativeness of our findings.

6. Conclusion

The broad array of justifications held by smokers and the misaligned perspectives between smokers and community workers have been largely ignored in current efforts to stop smoking. Future therapies should place smokers at the center of their decision-making in order to address their unique psychological reliance. When combined with eHealth technology and supply-side interventions, CCeSCI has a bright future in promoting smoking cessation with more acceptance, practicability, and generalizability.

7. Conflicts of interest

None.

Appendix A: Literature Review Search Strategy

<u>Research Question:</u> **What are the common misbeliefs that make quitting so difficult for east and southeast Asian adult male smokers?**[1]

Searched on: October 9, 2022

<u>Inclusion Criteria:</u>

- Have a primary focus on cigarette smoking
- Primarily focused on smoker's perceptions, misbeliefs or lay opinions about smoking or quitting
- Study targets must include male smokers over 25 years of age from a general population
- Study targets are generally healthy smokers (have no smoking-induced critical diseases such as cancer, COPD etc.)
- Written in either English or Chinese
- Participants either live in one of the following counties: Indonesia, Myanmar, Timor-Leste, Laos, Bangladesh, Mongolia, China, Nepal, Vietnam, Malaysia, Sri Lanka, India, Thailand (male smoking prevalence >40% in 2020), or are immigration from those countries

<u>Exclusion Criteria:</u>

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[1] High smoking prevalence means male smoking rate higher than 40% (2020). Targeted country list: Indonesia, Myanmar, Timor-Leste, Laos, Bangladesh, Mongolia, China, Nepal, Vietnam, Malaysia, Sri Lanka, India, Thailand

- Studies primarily focused on adolescents or young smokers
- Studies focused on secondary data analysis or used quantitative methods from which smokers' perception cannot be extracted descriptively
- Study targets are from a specific line of work (doctors, firefighters etc.)
- Studies with a primary focus on other forms of tobacco products such as water pipe, smokeless tobacco, or e-cigarettes, etc.
- Studies conducted on smokers with severe disabilities (such as cancer, mental health disorder etc.)
- Not in English or Chinese

Database (including vendor/platform): PubMed

<u>Search term:</u>

("smoking"[MeSH Terms] OR "tobacco"[MeSH Terms] OR "smok*"[Title/Abstract] OR "tobacco"[Title/Abstract] OR "cigarette"[Title/Abstract] OR "nicotine"[Title/Abstract]) **AND** ("adult"[MeSH Terms] OR "adult"[Title/Abstract] OR " aged"[Title/Abstract] OR "older" [Title/Abstract] OR "grown-up*" [Title/Abstract] OR "25+ years" [Title/Abstract]) **AND** ("male"[MeSH Terms] OR "man"[Title/Abstract] OR "men"[Title/Abstract]) **AND** ("personal risk"[Title/Abstract] OR "risk perception"[Title/Abstract] OR "perception*"[Title/Abstract] OR "cognit*"[Title/Abstract] OR "belief*"[Title/Abstract]) **AND** ("Asia*"[Title/Abstract] OR "Indonesia"[Title/Abstract] OR "Myanmar"[Title/Abstract] OR "Timor-Leste"[Title/Abstract] OR "Timor

Leste"[Title/Abstract] OR "Bangladesh"[Title/Abstract] OR "Laos"[Title/Abstract] OR "Mongolia"[Title/Abstract] OR "Nepal"[Title/Abstract] OR "China"[Title/Abstract] OR "Sri Lanka"[Title/Abstract] OR "Malaysia"[Title/Abstract] OR "Thailand"[Title/Abstract] OR "India"[Title/Abstract] OR "Vietnam"[Title/Abstract])

(Result: 513)

Database (including vendor/platform): China National Knowledge Infrastructure (CNKI)

Search term (in cnki term):

(吸烟 + 烟草 + 烟民 + 香烟 + 卷烟 + 吸食 + 尼古丁)[title] * (合理 + 风险 + 观点 + 态度 + 认知 + 感受 + 信念 + 信仰 + 感觉 + 想法) [title] * (成人 + 成年人 + 中年 + 老年 + 青年 + 25 岁以上)[full text]

(Result: 418)

Total papers for screening: 931

Appendix B: Qualitative Interview Guide

First, make an introduction and give a clear explanation of the purpose of the study. Make sure participants have signed the Letter of Informed Consent.

Then, start the conversation by following the major areas of discussion below. It is important to follow the thread of conversations and interests of the interviewees to explore the discussion at a more in-depth level.

Personal experience

How did you start smoking? Please share with us your smoking experience.

What is your opinion on quitting? Can you tell us your quitting stories? What are the major reasons for you to consider quitting? What do you think is the most difficult part? How do you feel when you quit (or stop quitting)?

Opinions on community tobacco control measures and quitting support:

What do you think about community tobacco control work? What are your observations, suggestions, and comments? Why?

What are the quitting support measures you heard about? What do you think about their effectiveness? What are your expectations?

What kind of quitting services do you hope to have in the community? What are the most important factors for you to consider using them?

Rationalization beliefs

While participants are talking, identify if they have already mentioned the beliefs that fall into the six domains below:

- Smoking Functional Beliefs
- Risk Generalization Beliefs
- Social Acceptability Beliefs
- Safe Smoking Beliefs
- Self-Exempting Beliefs
- Quitting is Harmful Beliefs

Mention the leftover items to the interviewees to seek their opinion and comments.

Do you have further things in mind that have made you want to continue smoking?

Can you share with us someone you know whose smoking beliefs or quitting experiences impressed you very much?

Comments on the CCeSCI

Briefly introduce CCeSCI to interviewees and ask for their comments. Ask the interviewees to give an overall rating and why they would give such a rating.

Lastly, repeat or rephrase the most important ideas of the interviewees to make sure our understanding is accurate. Conclude the interview with appreciation and give the participants the cash remuneration.

References

Airhihenbuwa, C. O. (2007). *Healing our differences: The crisis of global health and the politics of identity*. Rowman & Littlefield.

Airhihenbuwa, C. O., & Liburd, L. (2006). Eliminating health disparities in the African American population: the interface of culture, gender, and power. *Health Education & Behavior*, *33*(4), 488-501.

Anonymous. (2012). Community Workers are mostly Amy of Women. *The Community*(31), 1.

Bank, W. (2020). *Prevalence of current tobacco use in male adults* Global Health Observatory Data Repositor. https://data.worldbank.org/indicator/SH.PRV.SMOK.MA

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, *3*(2), 77-101.

Burgess, D. J., Mock, J., Schillo, B. A., Saul, J. E., Phan, T., Chhith, Y., Alesci, N., & Foldes, S. S. (2014). Culture, acculturation and smoking use in Hmong, Khmer, Laotians, and Vietnamese communities in Minnesota. *BMC Public Health*, *14*, 791. https://doi.org/10.1186/1471-2458-14-791

Byrd, J. C., Shapiro, R. S., & Schiedermayer, D. L. (1989). Passive smoking: a review of medical and legal issues. *American journal of public health*, *79*(2), 209-215.

Center for Disease Control and Prevention, U. (2022). *Tips From Former Smokers*. https://www.cdc.gov/tobacco/campaign/tips/index.html

Chapman, S., Wong, W. L., & Smith, W. (1993). Self-exempting beliefs about smoking and health: differences between smokers and ex-smokers. *American journal of public health*, *83*(2), 215-219.

Chean, K. Y., Goh, L. G., Liew, K. W., Tan, C. C., Choi, X. L., Tan, K. C., & Ooi, S. T. (2019). Barriers to smoking cessation: a qualitative study from the perspective of primary care in Malaysia. *BMJ Open*, *9*(7), e025491. https://doi.org/10.1136/bmjopen-2018-025491

China, S. A. f. M. R. o. t. P. s. R. o. (2016). *Temporary Regulations on Public Advertisement Promotion and Management*. Retrieved from https://gkml.samr.gov.cn/nsjg/ggjgs/201906/W020211115383474838383.pdf

Christopher, J. C., Wendt, D. C., Marecek, J., & Goodman, D. M. (2014). Critical cultural awareness: contributions to a globalizing psychology. *American Psychologist*, *69*(7), 645.

Cohn, L. D., Macfarlane, S., Yanez, C., & Imai, W. K. (1995). Risk-perception: differences between adolescents and adults. *Health psychology*, *14*(3), 217.

Davis, K. C., Patel, D., Shafer, P., Duke, J., Glover-Kudon, R., Ridgeway, W., & Cox, S. (2018). Association between media doses of the tips from former smokers campaign and cessation behaviors and intentions to quit among cigarette smokers, 2012-2015. *Health Education & Behavior*, *45*(1), 52-60.

Do, V. V., Spears, C. A., Van Minh, H., Huang, J., Redmon, P. B., Xuan Long, N., & Eriksen, M. P. (2020). Perceptions About Mindfulness and Text Messaging for Smoking Cessation in Vietnam: Results From a Qualitative Study. *JMIR Mhealth Uhealth*, *8*(6), e17337. https://doi.org/10.2196/17337

Dutta, M. J. (2007). Communicating about culture and health: Theorizing culture-centered and cultural sensitivity approaches. *Communication Theory*, *17*(3), 304-328.

Ebrey, P. B., & Walthall, A. (2013). *East Asia: A cultural, social, and political history*. Cengage Learning.

Ekpu, V. U., & Brown, A. K. (2015). The economic impact of smoking and of reducing smoking prevalence: review of evidence. *Tobacco use insights*, *8*, TUI. S15628.

Elton-Marshall, T., Fong, G. T., Yong, H. H., Borland, R., Xu, S. S., Quah, A. C., Feng, G., & Jiang, Y. (2015). Smokers' sensory beliefs mediate the relation between smoking a light/low tar cigarette and perceptions of harm. *Tob Control*, *24 Suppl 4*(0 4), iv21-27. https://doi.org/10.1136/tobaccocontrol-2014-051977

Forouzanfar, M. H., Afshin, A., Alexander, L. T., Anderson, H. R., Bhutta, Z. A., Biryukov, S., Brauer, M., Burnett, R., Cercy, K., & Charlson, F. J. (2016). Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. *The lancet*, *388*(10053), 1659-1724.

Fotuhi, O., Fong, G. T., Zanna, M. P., Borland, R., Yong, H.-H., & Cummings, K. M. (2013). Patterns of cognitive dissonance-reducing beliefs among smokers: a

longitudinal analysis from the International Tobacco Control (ITC) Four Country Survey. *Tobacco control*, *22*(1), 52-58.

Frandsen, T. F., Eriksen, M. B., Hammer, D. M. G., & Christensen, J. B. (2019). PubMed coverage varied across specialties and over time: a large-scale study of included studies in Cochrane reviews. *J Clin Epidemiol*, *112*, 59-66. https://doi.org/10.1016/j.jclinepi.2019.04.015

General, S. (2020). Smoking cessation–A report of the Surgeon General. *US Department of Health and Human Services*.

Glaser, B. (1978). Theoretical Sensitivity: Advances in the Methodology of Grounded Theory Procedures and Techniques. In: Sage Publications, CA, USA.

Grunberg, N. E., Winders, S. E., & Wewers, M. E. (1991). Gender differences in tobacco use. *Health psychology*, *10*(2), 143.

Hall, E. T. (1989). *Beyond culture*. Anchor.

Heatherton, T. F., Kozlowski, L. T., Frecker, R. C., & Fagerstrom, K. O. (1991). The Fagerström test for nicotine dependence: a revision of the Fagerstrom Tolerance Questionnaire. *British journal of addiction*, *86*(9), 1119-1127.

Hermalin, A. I., & Lowry, D. (2010). *The age prevalence of smoking among Chinese women: a case of arrested diffusion?* Population Studies Center, University of Michigan Ann Arbor.

Huang, M.-H., & Chang, S.-H. (2017). Similarities and differences in East Asian Confucian Culture: A comparative analysis. *OMNES: The Journal of Multicultural Society*, *7*(2), 1-40.

Huang, X., Fu, W., Zhang, H., Li, H., Li, X., Yang, Y., Wang, F., Gao, J., Zheng, P., Fu, H., Chapman, S., & Ding, D. (2019). Why are male Chinese smokers unwilling to quit? A multicentre cross-sectional study on smoking rationalisation and intention to quit. *BMJ Open*, *9*(2), e025285. https://doi.org/10.1136/bmjopen-2018-025285

Huang, X., Fu, W., Zhang, H., Li, H., Li, X., Yang, Y., Wang, F., Gao, J., Zheng, P., Fu, H., Ding, D., & Chapman, S. (2020). Development and validation of a smoking rationalization scale for male smokers in China. *J Health Psychol*, *25*(4), 472-489. https://doi.org/10.1177/1359105317720276

Huang, X. F., W. LI, H. ZHANG, H. LI, X. YANG, Y. WANG, J., & ZHOU, X. Z., Z. ZHENG, P. (2016). Relationship between the harmful beliefs to quit smoking and willingness to quit smoking among adult male smokers in China. *Chines Journal of Prevention and Control of Chronicle Diseases*, *24*(03), 183-186+191. https://doi.org/10.16386/j.cjpccd.issn.1004-6194.2016.03.006

Jackson, A. A., Manan, W. A., Gani, A. S., & Carter, Y. H. (2004). Lay beliefs about smoking in Kelantan, Malaysia. *Southeast Asian J Trop Med Public Health*, *35*(3), 756-763.

Jin, X., Sun, I. Y., Jiang, S., Wang, Y., & Wen, S. (2018). The relationships between job and organizational characteristics and role and job stress among Chinese community correctional workers. *International Journal of Law, Crime and Justice*, *52*, 36-46.

Jiraniramai, S., Likhitsathian, S., Jiraporncharoen, W., Thaikla, K., Aramrattana, A., & Angkurawaranon, C. (2015). Risk-Minimizing Belief: Its Association with Smoking and Risk of Harm From Smoking in Northern Thailand. *J Ethn Subst Abuse*, *14*(4), 364-378. https://doi.org/10.1080/15332640.2014.991468

King, B., Yong, H. H., Borland, R., Omar, M., Ahmad, A. A., Sirirassamee, B., Hamann, S., O'Connor, R. J., Bansal-Travers, M., Elton-Marshall, T., Lee, W. B., Hammond, D., & Thrasher, J. (2010). Malaysian and Thai smokers' beliefs about the harmfulness of 'light' and menthol cigarettes. *Tob Control*, *19*(6), 444-450. https://doi.org/10.1136/tc.2009.034256

Kohrt, B. A., Jordans, M. J., Tol, W. A., Luitel, N. P., Maharjan, S. M., & Upadhaya, N. (2011). Validation of cross-cultural child mental health and psychosocial research instruments: adapting the Depression Self-Rating Scale and Child PTSD Symptom Scale in Nepal. *BMC psychiatry*, *11*(1), 1-17.

Kozlowski, L., & O'connor, R. (2002). Cigarette filter ventilation is a defective design because of misleading taste, bigger puffs, and blocked vents. *Tobacco control*, *11*(suppl 1), i40-i50.

Kozlowski, L. T., & Pillitteri, J. L. (2001). Beliefs about “Light” and “Ultra Light” cigarettes and efforts to change those beliefs: an overview of early efforts and published research. *Tobacco control*, *10*(suppl 1), i12-i16.

Lafferty, C. K., Heaney, C. A., & Chen, M. S., Jr. (1999). Assessing decisional balance for smoking cessation among Southeast Asian males in the US. *Health Educ Res*, *14*(1), 139-146. https://doi.org/10.1093/her/14.1.139

Latkin, C. A., & Knowlton, A. R. (2015). Social network assessments and interventions for health behavior change: a critical review. *Behavioral Medicine*, *41*(3), 90-97.

Lee, W. B., Fong, G. T., Zanna, M. P., Omar, M., Sirirassamee, B., & Borland, R. (2009). Regret and rationalization among smokers in Thailand and Malaysia: findings from the International Tobacco Control Southeast Asia Survey. *Health Psychol*, *28*(4), 457-464. https://doi.org/10.1037/a0014669

Li, Q., Hsia, J., & Yang, G. (2011). Prevalence of smoking in China in 2010. *New England Journal of Medicine*, *364*(25), 2469-2470.

Lin, W., & Sloan, F. (2015). Risk perceptions and smoking decisions of adult Chinese men. *J Health Econ*, *39*, 60-73. https://doi.org/10.1016/j.jhealeco.2014.11.006

Lu, C. G., Zheng, P. T., J.G., & Yu, X. L., X. X. (2017). Analysis About the Smoking Rationalizations Between Farmer Smokers and Non-Farmer Smokers in the Qingpu District, Shanghai *Health Education & Health Promotion*, *12*(06), 545-548. https://doi.org/10.16117/j.cnki.31-1974/r.201706011

Ma, S., Hoang, M.-A., Samet, J. M., Wang, J., Mei, C., Xu, X., & Stillman, F. A. (2008). Myths and attitudes that sustain smoking in China. *Journal of health communication*, *13*(7), 654-666.

Mao, Y. Z., P., Wang, B. S., C. Huang, J., & Eriksen, M. R., P. (2020). Cognition of the relationship between smoking and COVID-19 and its impact on daily cigarette consumption among smokers. *Fudan Journal of Medical Science*, *47*(06), 830-836. https://kns.cnki.net/kcms/detail/31.1885.r.20200917.1114.002.html

Oakes, W., Chapman, S., Borland, R., Balmford, J., & Trotter, L. (2004). "Bulletproof skeptics in life's jungle": which self-exempting beliefs about smoking most predict lack of progression towards quitting? *Preventive medicine*, *39*(4), 776-782.

Oriola, T. A. (2009). Ethical and legal analyses of policy prohibiting tobacco smoking in enclosed public spaces. *The Journal of Law, Medicine & Ethics*, *37*(4), 828-840.

Pan. L, & C, J. (2015). The association between attributing smoking to genetic cause and successful smoking cessation.

Patel, V., Minas, H., Cohen, A., & Prince, M. (2013). *Global mental health: principles and practice*. Oxford University Press.

Pearse, N. (2019). An illustration of deductive analysis in qualitative research. 18th European conference on research methodology for business and management studies,

Pellmar, T. C., Brandt Jr, E. N., & Baird, M. A. (2002). Health and behavior: the interplay of biological, behavioral, and social influences: summary of an Institute of Medicine report. *American Journal of Health Promotion*, *16*(4), 206-219.

Reitsma, M. B., Fullman, N., Ng, M., Salama, J. S., Abajobir, A., Abate, K. H., Abbafati, C., Abera, S. F., Abraham, B., & Abyu, G. Y. (2017). Smoking prevalence and attributable disease burden in 195 countries and territories, 1990–2015: a systematic analysis from the Global Burden of Disease Study 2015. *The lancet*, *389*(10082), 1885-1906.

Rudy, J. (2005). *The freedom to smoke: tobacco consumption and identity* (Vol. 18). McGill-Queen's Press-MQUP.

Seangpraw, K., & Tonchoy, P. (2019). Factors Related Intention To Smoking Cessation Among Thai People Who Joined Quit Smoking Project For The King: A Cross-Sectional Study Of Northern Thailand. *J Ayub Med Coll Abbottabad*, *31*(4), 512-516.

Shaw, S. J., Huebner, C., Armin, J., Orzech, K., & Vivian, J. (2009). The role of culture in health literacy and chronic disease screening and management. *Journal of Immigrant and Minority Health*, *11*(6), 460-467.

Shiffman, S., Pillitteri, J. L., Burton, S. L., Rohay, J. M., & Gitchell, J. G. (2001). Smokers' beliefs about “Light” and “Ultra Light” cigarettes. *Tobacco control*, *10*(suppl 1), i17-i23.

Sikkema, K. J., Choi, K. W., Robertson, C., Knettel, B. A., Ciya, N., Knippler, E. T., Watt, M. H., & Joska, J. A. (2018). Development of a coping intervention to improve traumatic stress and HIV care engagement among South African women with sexual trauma histories. *Evaluation and Program Planning*, *68*, 148-156.

Spigner, C., Shigaki, A., & Tu, S. P. (2005). Perceptions of Asian American men about tobacco cigarette consumption: a social learning theory framework. *J Immigr Health*, *7*(4), 293-303. https://doi.org/10.1007/s10903-005-5126-y

Stuart-Fox, M. (2021). *A short history of China and Southeast Asia: tribute, trade and influence*. Allen & Unwin.

Sun, Y. Q., Gao, J.R. Chen, D. (2019). *Analysis on the Demand of Smoking Cessation Service Standardized Training* The 20th National Tobacco Control Seminar and the 10th Cross Strait and Hong Kong, Macau Tobacco Prevention and Treatment Seminar,

Sweetland, A. C., Belkin, G. S., & Verdeli, H. (2014). Measuring depression and anxiety in Sub-Saharan Africa. *Depression and anxiety*, *31*(3), 223-232.

Tu, S. P., Walsh, M., Tseng, B., & Thompson, B. (2000). Tobacco Use by Chinese American Men: An Exploratory Study of the Factors Associated with Cigarette Use and Smoking Cessation. *Asian Am Pac Isl J Health*, *8*(1), 46-57.

von Thiele Schwarz, U., Nielsen, K., Edwards, K., Hasson, H., Ipsen, C., Savage, C., Simonsen Abildgaard, J., Richter, A., Lornudd, C., Mazzocato, P., & Reed, J. E. (2021). How to design, implement and evaluate organizational interventions for maximum impact: the Sigtuna Principles. *European Journal of Work and Organizational Psychology*, *30*(3), 415-427. https://doi.org/10.1080/1359432X.2020.1803960

Wang, L., Shen, Y., Jiang, Y., & Yang, Y. (2015). Investigation and analysis on current status of smoking cessation clinics in China. *Zhonghua liu Xing Bing xue za zhi= Zhonghua Liuxingbingxue Zazhi*, *36*(9), 917-920.

Weng, W., & Chen, J. (1996). The Eastern perspective on functional foods based on traditional Chinese medicine. *Nutrition Reviews*, *54*(11), 6.

White, J. S., Toussaert, S., Thrul, J., Bontemps-Jones, J., Abroms, L., & Westmaas, J. L. (2020). Peer mentoring and automated text messages for smoking cessation: a randomized pilot trial. *Nicotine and Tobacco Research*, *22*(3), 371-380.

Wu, X. Y., Y. Jiang, Y. (2009). Smoking Cessation Clinics in China. *Journal of Hygiene Research*(1), 50-52.

Xia, W., Li, H. C. W., Song, P., Ho, K. Y., Luo, Y., Liang, T., Ho, L. L. K., Cheung, A. T., & Cai, W. (2021). Perceptions, behaviours and attitudes towards smoking held by the male partners of Chinese pregnant women: a qualitative study. *BMC Public Health*, *21*(1), 1901. https://doi.org/10.1186/s12889-021-11966-4

Yasin, S. M., Masilamani, R., Ming, M. F., Koh, D., & Zaki, R. A. (2012). Can initial perceptions about quitting predict smoking cessation among Malaysian smokers? *Southeast Asian J Trop Med Public Health*, *43*(2), 501-509.

Yen, C. L. (2013). It is our destiny to die: The effects of mortality salience and culture-priming on fatalism and karma belief. *International Journal of Psychology*, *48*(5), 818-828.

Ying-qiu Yin, W.-s. L., Jie Wei, Yin-lou Yang. (2018). Effect of cognitive behavioral intervention on smoking cessation among smokers with different educational

backgrounds. *Journal of Clinical Pulmonary Medicine*, *23*(08), 1383-1386.

Zanchi, D., Brody, A., Borgwardt, S., & Haller, S. (2016). Sex effects on smoking cue perception in non-smokers, smokers, and ex-smokers: a pilot study. *Frontiers in Psychiatry*, *7*, 187.

Zhao, X., & Davey, G. (2015). Contesting modernity: Tobacco use and romanticism among older Dai farmers in Xishuangbanna, China. *Sociol Health Illn*, *37*(8), 1173-1190. https://doi.org/10.1111/1467-9566.12305