ATTITUDES TOWARDS A SMOKING BAN IN RESTAURANTS OF MANAGERS, EMPLOYEES AND CUSTOMERS IN KUNMING CITY, CHINA

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Abstract. The objective of this study was to investigate the attitudes of restaurant managers, employees and customers towards a total smoking ban policy in restaurants. A restaurant based survey in an urban area of Kunming City, China, was carried out from May to August 2009. One hundred managers, 1,055 employees and 5,213 customers aged 15 years or above were interviewed using a structured questionnaire. The percentage of respondents supporting a total smoking ban in restaurants was 17% among managers, 13.4% among employees, and 16.6% among customers. Multilevel analysis confirmed respondents who did not smoke, who were educated, and who worked or dined at a restaurant with fewer than 200 seats were more likely to support a total smoking ban. A total smoking ban in restaurants is unlikely to be supported by people involved in the restaurant business in the study area. This coincides with poor awareness of the harms of smoking.

Key words: smoking ban, restaurant, attitude, China

INTRODUCTION

Smoking in China has been estimated to cause about one million deaths a year (Liu *et al*, 1998; Peto *et al*, 2009) and a huge economic burden (Sung *et al*, 2006). The Chinese government is aware of the negative impact of smoking, and recently adopted a partial smoking ban and ratified the World Health Organization's Framework Convention on Tobacco Control (FCTC) (WHO, 2008).

Amidst the high prevalence of tobacco use (31.4%) (Yang *et al*, 2005), China does not have a comprehensive smoke free law at the national level. National regulations for sanitary administration of public places stipulate smoking is banned in thirteen types of public places. Restaurants, a public place where both workers and customers are most exposed to second hand smoke [National Cancer Institute (US), 1993], are not included in the regulation.

Studies in the USA and Australia on the implementation of legislative bans on smoking in restaurants have found the bans were accepted to the public (Miller *et al*, 2002; Gilpin *et al*, 2004), without any loss of sales (Scollo *et al*, 2003). A smoke-free policy in restaurants drastically improves air quality, reduces exposure to second hand smoke (Fernando *et al*, 2007) and

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improves the health of workers (Allwright *et al*, 2005). A smoke-free policy for restaurants may help improve social norms regarding the unacceptability of tobacco use, and reduce the prevalence of tobacco use among the general people (Alamar and Glantz, 2006).

The above findings in a context of low smoking prevalence may not be generalized to China where the smoking prevalence is high. Studies are needed to assist policy makers before any new policies can be implemented. The objective of the current study was to assess attitudes toward a smoking ban among managers, employees and customers in urban restaurants of Kunming City, China.

MATERIALS AND METHODS

Study setting

Yunnan is one of the poorest provinces in southwestern China. More than 1/3 of tobacco leaves in China are produced there annually. All production of tobacco is under government monopoly. Around seven million Yunnanese are directly involved in this industry.

Kuming is the capital of Yunnan Province, well known for its mild temperate climate and relatively low level of air pollution from industries. In 2008 the reported smoking rate was nearly 30% among city residents, similar to the national adult average of 31.4%. Xishan District, where this study was conducted, is one of four central districts of Kunming City. There are approximately 4,080 restaurants registered and regularly inspected by the district health bureau.

Restaurants and respondents selection

Of the 246 restaurants scheduled for inspection during May to August 2009, 104 were randomly selected. The study population consisted of the managers and the employees who were currently working in those restaurants, and their customers, aged 15 and above.

Interview method

Data on demographic characteristics, personal smoking status, personal perceptions about the effects of smoking in restaurants, and preference about proposed tobacco control policies, were collected by face-to-face interviews with managers and employees, and by self-completion of forms by customers.

The demographic factors recorded for all subjects were gender, age, education, and length of time worked in the restaurant for employees, and frequency of restaurant visits per week for customers.

For current smoking status, the respondents was classified into daily smokers, non-daily smokers and non-smokers. The respondents were requested to choose the smoking ban policy they approve of: no ban (smoking is allowed anywhere), partial ban (designate a no smoking area) and total ban (smoking is not allowed anywhere). For analysis, this was divided as support for a total ban or less than a total ban.

Perceptions regarding the effects of smoking in restaurants were measured on a 5-point scale: "strongly agree", "agree", "neutral", "disagree" and "strongly disagree". To improve paticipation the number of items in this part were kept to a minimum. Data regarding restaurant characteristics were obtained from the managers' questionnaire. Variables included restaurant size (number of seats), average spending per customer, tobacco selling and availability of private compartments.

Statistic analysis

Descriptive statistics were used. Cross tabulation was made between respondent

characteristics and support for a total smoking ban. Significance of associations was initially assessed with the χ^2 test.

As gender, smoking status and education were potentially confounding, logistic regression was applied to identify independent predictors for support of total smoking ban. Since groups of employees and customers working or eating in the same restaurant environment might tend to give similar responses to the questionnaire, a multilevel mixed effects logistic regression model was used. In this modelling process, independent variables have fixed effects for all subjects, whereas subjects from the same restaurant shared restaurant specific variables. For example, employees of the same restaurant share the same base line odds of preferring smoking ban. The same assumption was also applied to the customer group. All independent variables were first included in the model with subsequent backward elimination. Those having a *p*-value >0.05 were removed one-by-one by descending order of their *p*-values until the models consisted of only a significant covariate. As we had a only few items on perception, and they were also outcome variables, these variables were not included in the models.

Epidata (Lauritsen and Bruus, 2003-2004) was used for data entry, and R software (R Development Core Team, 2009) was used for all statistical analysis. The package lme4 (Douglas and Martin, 2009) was used for mixed effects models.

RESULTS

Among the 104 restaurants selected for the study, 4 refused to participate. Of the remaining 100 restaurants, data were collected only from the managers in 11 restaurants. In the remaining 89 restaurants

all three groups were interviewed. Of the 1,055 approached employees, the response rate was 100%. The response rate of the customers could not be assessed. The total number of customers who responded was 5,213.

Characteristics of restaurants and respondents

The size of the 100 investigated restaurants ranged from 50 to 1,000 seats with a median of 200 seats. The average spending per customer was from 10 to 300 Chinese Yuan (CNY) with a median of 30 CNY. Forty restaurants sold tobacco, and 82 restaurants had private compartments.

Table 1 summarizes the characteristics of the respondents. Most respondents were young adults. While the managers were balanced in gender, females predominated among employees and males among customers. A higher smoking rate was seen among the men in all three groups.

Individual characteristics and a total smoking ban policy

Table 2 shows the relationship between characteristics of the respondents and support for a total smoking ban. Among managers, smoking status was the only significant factor. This factor was also consistently significant in the other two groups. University graduates had a high rate of supporting a total smoking ban among employees and customers. The same was true among customers. Females had more support for a smoking ban than males. Those who visited the restaurant less than twice per week were also more supportive of a total smoking ban.

Table 3 shows the result of fitting the logistic regression model to the data. For employees and customers, random effects (intercepts) were also added. Since the interactions among the covariates were not

Table 1
Characteristics of restaurants and subjects.

Variable	Manager (100)	Employee (1,055)	Customer (5,213)
Age			
Min-max (Median)	19-65 (29)	16-53 (20)	15-78 (29)
Sex			
Male (%)	50 (50)	330 (31.3)	3,134 (60.1)
Female (%)	50 (50)	725 (68.7)	2,079 (39.9)
Education			
Secondary or lower (%)	30 (30)	714 (67.7)	951 (18.2)
High school (%)	53 (53)	280 (26.5)	2,196 (42.1)
University (%)	17 (17)	55 (5.2)	2,029 (38.9)
Smoking status			
Daily smoker (%)	19 (19)	112 (10.6)	1,399 (26.8)
Non-daily smoker (%)	17 (17)	193 (18.3)	1,392 (26.7)
Non-smoker (%)	64 (64)	750 (71.1)	2,422 (46.5)
Length of time employed in restaurant (years)			
Min-max (median)	-	<1-30 (2)	-
Frequency of restaurant visits (times/week)			
Min-max (median)	-	-	<1-14 (2)

statistically significant, they were not included in the model.

The predictors of supporting a total smoking ban were non-smoker in all groups, high education among employees and customers, and less frequent restaurant visits among customers. After adjustment of these factors, female customers were less supportive of a smoking ban than their male counterparts. Customers who dined at large restaurants (>200 seats) were less likely to support a smoking ban. The intraclass correlation coefficient (ICC) among employees (41.6%) was much higher than among customers (6.3%) indicating that the preference of an employee was similar to his/her peers in the same restaurant, but that of the customer was more independent.

Perceptions regarding effect of smoking in restaurants

Table 4 summarizes respondents' per-

ceptions regarding the effects of smoking in restaurants. Most managers forbid employees from smoking in restaurants, but were reluctant to comment on a customer's personal smoking rights in the restaurant. Managers had a relative strong perception that second hand smoking caused bad health for employees and customers. They were also concerned that smoking was unclean and unsafe for restaurants. Managers and employees were not strongly worried about the effect a total smoking ban would have on income. Restaurant employees and customers were not strongly concerned about the harmful effects of passive smoking.

DISCUSSION

Of the 100 restaurants managers, over 1,000 employees and over 5,000 customers, low support for a total smoking ban was found among all three subject groups.

Table 2
Individual characteristics in relation to a total smoking ban policy.

Variable	Manager		Employee		Customer	
	Support/total (%)	χ^2 test p	Support/total (%)	χ^2 test p	Support/total (%)	χ^2 test p
All subjects	17/100(17)		141/1,055(13.4)		865/5,213(16.6)	
Sex		0.29		0.02		<0.01
Male	6/50(12)		32/330(9.7)		445/3,134(14.2)	
Female	11/50(22)		109/725(15)		422/2,079(20.3)	
Age		0.93		0.63		0.22
<30 years	9/51(17.6)		63/440(14.3)[a]		423/2,473(17.1)	
≥30 years	8/49(16.3)		76/581(13.1)[b]		365/2,313(15.8)	
Education		0.36		<0.01		<0.01
Secondary or lower	5/30(16.7)		100/714(14)		117/951(12.3)	
High school	11/53(20.8)		26/280(9.3)		343/2,196(15.6)	
University	1/17(5.9)		14/55(25.5)		400/2,029(19.7)	
Smoking status		0.02		<0.01		<0.01
Daily smoker	1/19(5.3)		2/112(1.8)		59/1,399(4.2)	
Non-daily smoker	0/17(0)		13/193(6.7)		157/1,392(11.3)	
Non-smoker	16/64(25)		126/750(16.8)		649/2,422(26.8)	
Length of time employed in restaurant				0.35		
<2 years	-		67/455(14.7)		-	
≥2 years	-		58/468(12.4)		-	
Frequency of restaurant use						<0.01
<2 times/week	-		-		221/1,098(20.1)	
≥2 times/week	-		-		527/3,272(16.1)	

%, prefers rate for a total smoking ban
[a]<20 years; [b]≥20 years

The ban policy was significantly more popular among female employees and customers during crude analysis. However, after adjustment for other factors, the reverse was true in the final model for customers. Both managers and customers in large restaurants were less likely to prefer a total smoking ban. This low level of support for a ban coincided with a low knowledge level regarding the adverse effects of health smoking among employees and customers but not mangers.

In our current study, support rates for a total smoking ban were less than 20% in all 3 groups. Similar results were seen in California, USA. In that study, 17.3% of bar owners and staff supported a total smoking ban before a smoke-free law was implemented in 1998. After smoke-free bar law legislation, many health promotion approaches have been employed to promote and facilitate implementing this law. The support rate increased to 50.9% in 2002 (Tang *et al*, 2004). Among bar patrons (Tang *et al*, 2003) the support rate before law implementation was 59.8%, higher than among bar owners and staff; it rose to 73.2% after law implementation. Research regarding public attitudes before and after smoke-free law implementation from

Table 3
Predictors for support of a total smoking ban policy in restaurants.

Variable	Manager	Employee	Customer
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Individual level variables			
Sex			
Male			1
Female	NS	NS	0.56(0.45-0.69)
Age			
<30 years		1	1
≥30 years	NS	1.02(0.62-1.68)[b]	1.17 (0.97-1.42)
Education			
Primary school or lower	1	1	1
High school	4.02(0.89-18.13)	0.84(0.46-1.52)	1.38(1.04-1.83)
University	0.65(0.06-7.42)	5.46(2.01-14.84)	1.87(1.40-2.49)
Smoking status			
Daily smoker	1	1	1
Non-daily smoker	-	1.95(0.34-11.08)	2.58(1.81-3.68)
Non-smoker	21.3(2.31-196.3)[a]	7.95(1.61-39.30)	11.57(8.24-16.26)
Length of time employed in restaurant			
<2 years	-	1	-
≥2 years	-	0.97(0.59-1.61)	-
Frequency of restaurant use			
<2 times/week	-	-	1
≥2 times/week	-	-	0.74(0.60-0.91)
Restaurant level variables			
Restaurant size			
≤200 seats	1		1
>200 seats	0.25(0.06-0.95)	NS	0.59(0.42-0.83)
Average spending per customer			
≤30 CNY			
>30 CNY	NS	NS	NS
Selling tobacco in restaurant			
No			
Yes	NS	NS	NS
Private compartment in restaurant			
No	1	1	
Yes	0.32(0.07-1.43)	0.30(0.12-0.76)	NS
ICC	-	41.64%	6.25%

AOR, adjusted odds ratio; CI, confidence interval; NS, non-significant
ICC, intraclass correlation coefficient; CNY, China Yuan
[a]non-smoker *vs* smoker; [b]<20 years *vs* ≥20 years

California (Gilpin *et al*, 2004) and Australia (Miller *et al*, 2002) shows support for a complete smoking ban in restaurants increased. We can optimistically assume support for a smoking ban in restaurants will improve after implementation of the ban. The current challenge is low support among participants.

Table 4
Perceptions regarding effect of smoking in a restaurant.

Item	Manager		Employee		Customer	
	N	Mean (SD)	N	Mean (SD)	N	Mean (SD)
Smoking in a restaurant is the personal right of the customer	100	2.55 (0.88)	1,053	2.87 (1.03)	5,212	2.81 (1.22)
A customer smoking in a restaurant affects the health of other customers	100	1.76 (0.90)	1,051	2.22 (1.06)	5,212	2.40 (1.13)
A customer smoking in a restaurant affects the health of the employees	100	1.88 (0.96)	1,049	2.27 (1.11)	5,213	2.44 (1.17)
Smoking makes a restaurant unclean	100	1.80 (0.93)	-	-	-	-
Smoking makes a restaurant unsafe	100	1.82 (1.02)	-	-	-	-
Totally banning smoking may reduce the income of the restaurant	100	2.40 (1.41)	1,055	2.53 (1.18)	-	-

Rating score: 1 = strongly agree   2 = agree   3 = neutral   4 = disagree   5 = strong disagree

The sex effect in this study is interesting. Other strong predictors, such as smoking status and education, confounded the effect of sex. Crude cross tabulation made it appear that females were likely to support a smoking ban because of the confounding effects of these two variables. After adjustment, the independent effect of females was not supportive of a ban. In western countries (Borland *et al*, 2006) and Hong Kong (Lam *et al*, 2002) research showed a non-significant effect of female sex on support for a total smoking ban. In these areas, the prevalence of tobacco use was relatively low, and smoking is unacceptable behavior in the society. In China, smoking is a usual behavior, and is accepted. A recent study from China (Ho *et al*, 2009) showed ever-smoking rate among young Chinese women has increased in the last decade, and respondents are less aware of the harm caused by smoking. In our study, most of the subjects were young. The negative impact among females reflects inadequate tobacco control interventions.

We found restaurant characteristics had an effect on the subjects' support. Diners who eat at small restaurants prefered a total ban. This may be linked with poor air quality in enclosed public places where unacceptably high levels of nicotine have been found (Valente *et al*, 2007). People who have experiences of discomfort or dissatisfaction from exposure to passive smoking in restaurants are more likely to support a total smoke-free policy (Lam *et al*, 2002). Some studies have found separating smokers from non-smokers within the same air space does not eliminate exposure to second-hand smoke. The only effective protection strategy is a 100% indoor smoke-free policy.

As expected, smoking status was among the strongest predictors for support

of a total smoking ban. Non-smokers were more likely to favor a total ban. The public health establishment is deeply concerned with human rights, and emphasizes as a core principle freedom from harm (Katz, 2005). In western countries, the right of non-smokers (especially children) to breathe smoke-free air has been emphasized, and the tobacco control movement's dedication to rights is visible in the names of the leading pro-control groups, such as Canada's ''Non-Smokers' Rights Association'', and the America's ''Americans for Non-smokers' Rights''. Human rights can be an invaluable adjunct to a wide range of tobacco control projects (Jacobson and Banerjee, 2005). In developing countries where human rights are not a campaign issue, alternative strategies should be sought.

There were certain limitations in our study. The effect of restaurant managers was less due to the fewer number of managers than employees and customer. It was not possible to randomly select customers, however, the low ICC (6%) indicates customers were relatively independent from one another but the employees were not, which is seen by the ICC of 42%.

In summary, the percentage of subjects supporting a total smoking ban in restaurants in Kunming was low, and was supported more by non-smokers and educated people. The low level of support coincides with poor perceptions regarding the harm from second-hand smoke. Implementation of a total ban smoking policy should be preceded by a public health education campaign targeting those important groups.

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