Positive correlation between post-cessation weight concerns and intentions to quit smoking in Chinese male smokers: A cross-sectional study

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ABSTRACT

INTRODUCTION Concerns about post-cessation weight gain might influence the attempts to quit smoking. The knowledge about post-cessation weight gain, the post-cessation weight concerns, and their relationship to smoking quit intention have not been thoroughly studied in the Chinese population.

METHODS The present study is a cross-sectional study, which included a convenience sample of 1037 male smokers intending to quit smoking from Chongqing, China. Questionnaire-based investigations were conducted to assess sociodemographic characteristics, post-cessation weight concerns, and the intention to quit smoking. Multivariable logistic regression analysis was performed to assess the relationship between post-cessation weight concerns and intentions to quit smoking.

RESULTS The perception levels of post-cessation weight gain were low in the study population, and only 36.07% of respondents knew that 'smoking cessation will affect the weight of smokers'. Generally, the medium post-cessation weight concern score was 2.16 on a 10-point scale, and only 8.29% of the participants had scores >5. Participants with a higher degree of concern regarding post-cessation weight gain had a higher adjusted odds ratio (AOR) for intentions to quit smoking (AOR=1.47; 95% CI: 1.09–1.97) compared to participants with lower weight concerns in the fully adjusted regression model.

CONCLUSIONS The extent of post-cessation weight concerns was low, partially due to the low perception of weight gain associated with smoking cessation. Moreover, the intentions to quit smoking were positively associated with post-cessation weight concerns. Consequently, it appears that weight concerns have not been a significant deterrent to the intention to quit smoking among the study population.

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INTRODUCTION

Tobacco smoking is an important cause of preventable premature mortality worldwide. In 2017, approximately 2.5 million people died from tobacco use[1], and if current smoking rates continue, as many as 3 million people will die from tobacco use each year in China[2]. Smoking cessation can significantly reduce the occurrence of many chronic diseases and bring about immediate health benefits[3], including decreased risks of stroke, cardiovascular disease, and smoking-related cancers[4-6]. Having an intention to quit is a prerequisite for preparing and taking smoking cessation action based on stage-based models of behavior change[7,8]. Intentions to quit smoking are associated with many factors, including gender, age, education level, race, level of nicotine dependence, self-efficacy, and past

quit attempts[9]. However, the association between post-cessation weight concerns and intention to quit smoking was inconsistent or insufficient[10-12].

Smoking cessation is associated with weight gain. One study revealed that approximately 80% of smokers would experience weight gain after quitting smoking[13]. A meta-analysis study found that the average weight gain was 4.1 kg in five years after smoking cessation, with 1.5 kg in continued smokers[14]. Some previous studies have shown that weight gain after quitting smoking may increase the risk of diabetes and hypertension, and weight gain is closely related to personal appearance[15-18]; it is proposed that fear of post-cessation weight gain might lower the intentions to attempt or seek treatment for quitting smoking and even reduce cessation rates[19].

It is important to study the post-cessation weight concerns, particularly in people intending to quit smoking. The reported prevalence of weight concerns in smokers intending to quit smoking varies from 22.1% to 60.6%, depending on the study population and design[20-22]. Recent researchers have reported that higher levels of weight concerns were associated with woman[23] experiencing weight gain in previous quit attempts[24], higher BMI, and higher level cognition of post-cessation weight gain (for example, the cognition of 'smoking cessation will affect the weight of smokers')[25,26] and more cigarettes per day[23]. As female smokers were more likely than male smokers to be concerned about post-cessation weight gain[27], previous studies focused on concerns about weight gain after quitting among female smokers and the effects of related interventions[28,29]. Previous studies found that there are also post-cessation weight concerns among male smokers. Clark et al.[22] reported that 25.17% of male smokers reported having weight concerns. In China, the majority of smokers are males[30]. However, the epidemiological characteristics of the perception of post-cessation weight gain and post-cessation weight concerns in male smokers have not been investigated until now. Therefore, the present study explores the characteristics about perception of weight gain associated with smoking cessation, and post-cessation weight concerns, and the associations between post-cessation weight concerns and intentions to quit smoking in male smokers from Chongqing, the largest metropolitan city in China.

METHODS

Study population

The present study is a cross-sectional study, which is consisted of 1037 male smokers planning to quit smoking from four districts of Chongqing: Yuzhong, Shapingba, Jiulongpo and Bishan . Convenience sampling was used and the participants were surveyed in parks or city squares selected from these districts in July 2017. Eligibility criteria of the study were residents who were males, aged 18–80 years, currently smoking at least 1 cigarette per day (including e-cigarettes), and intentions to quit smoking in the next year. Exclusion criteria included a diagnosis of current psychopathology, cancer, myocardial infarction, and severe stroke diseases. Participants voluntarily enrolled in the trial following informed consent procedures and completed a 9–13 minutes face-to-face questionnaire survey outdoors. A total of 1179 subjects were surveyed among 1215 eligible subjects (response rate 97.04%). Among the 1179 subjects, 1037 male smokers finished all questionnaires and were included. Study procedures were by institutional guidelines and approved by the Institutional Review Board of Chongqing Medical University.

The present investigation included interviewer administration of screening and baseline interviews. Screening interviews collected sociodemographic, smoking status, intentions to quit smoking, and disease history. Baseline interviews included questions relevant to the study aims (sociodemographic, perception of weight gain after smoking cessation, weight concerns, intentions to quit, smoking situation, and others). The questionnaire was designed based on literature and an expert consultation, and the validity of the questionnaire was tested through a small sample survey (n=33). For difficult questionnaire questions, the investigator explained them further so that the subject could better understand the question. Training procedures for Chongqing Medical University undergraduate interview staff included: 1) intensive training by the project leader, 2) assessment of participant comprehension of items, 3) unified verification standard to ensure data collection integrity, and 4) double data entry of participant responses to ensure accurate response coding.

Measures

Sociodemographic characteristics

The present study included sociodemographic characteristics such as age (≤29, 30–40, 40–50, 50–60, ≥60 years), race (Han nationality, ethnic minorities), region (urban district, villages, and towns), marital status (single or married/living with a partner), an education level (low: illiterate or primary school; medium: high school or technical secondary school; and high: university or junior college), monthly income (in US$ equivalent) (<270, 270–680, ≥680). Self-reported height and weight were collected to calculate the BMI (kg/m^2).

Perception of weight gain after quitting smoking

Participants were asked four items to assess their perception of weight gain after smoking cessation. Responses categories included: 'agree', 'neither agree nor disagree', 'disagree', and 'don't know'. Pre-survey results showed that the internal consistency of this item was high (α=0.879).

Post-cessation weight concerns

Participant weight concerns score was obtained by calculating the mean response to 6 items using a 10-point Likert scale (1=not at all, to 10=very much)[31]. Internal consistency was moderately high (α=0.802). A score ≥5 indicated clear concerns about weight gain after quitting smoking. For the analysis of associations between the perception of post-cessation weight gain and post-cessation weight concerns, and post-cessation weight concerns and intentions to quit smoking, post-cessation weight concerns score was dichotomized at the median (score ≤2.16 defined higher weight concerns, score ≤2.16 defined lower weight concerns).

Intentions to quit smoking

The intention to quit smoking score was measured using the question: 'How strong is your intention to quit?'. The responses were scored on a 10-point scale that ranged from 1 (being not strong at all) to 10 (being extremely strong). For the analysis of associations between post-cessation weight concerns and intentions to quit smoking, the intentions to quit smoking score was dichotomized at the median (a score >5 defined higher intentions to quit smoking, and a score ≤5 defined lower intentions to quit smoking).

Other smoking-related variables

Nicotine dependence was measured by the Fagerström test for nicotine dependence[32]. Participant's nicotine dependence score was obtained by calculating the sum of responses to 6 items (0=not at all, to 10=very much). This 6-item self-report measure has adequate internal consistency (α=0.879). The age started smoking was measured by asking: 'How old where you when you started smoking regularly?'. The variable was converted into three ranges: <18, 18–22, and ≥23 years. Similarly, smoking duration was measured using the question: 'How long have you been smoking?'. The variable was classified as ≤10 and >10 years. Self-reported cigarettes per day were measured by the question: 'How many cigarettes do you smoke every day?'. The variable was converted into four ranges: 1–10, 11–20, 21–30, and ≥31. We assessed variables related to smoking cessation situation, including whether or not to attempt smoking cessation (no, yes), the total number of previous smoking cessation attempts (1–5, >5), whether or not gained weight in previous smoking cessation attempts (no, yes) and the maximum amount of weight gain in quitting smoking attempts (<5, ≥5 kg). Controlling weight gain efficacy after quitting (WEAQ) score was obtained by calculating the mean response to 6 items using a 10-point Likert scale (1=not at all confident, to 10=very confident)[31]. Internal consistency was moderately high (α= 0.855).

Statistical analysis

We carried out descriptive analyses of participants' characteristics, the perception of weight gain after quitting smoking, and post-cessation weight concerns. All categorical variables were described as frequencies and percentages, while continuous variables were summarized as median and interquartile range (IQR). Unadjusted (OR) and adjusted odds ratio (AOR) and 95% confidence intervals (95% CI) were calculated using multiple logistic regression analysis to explore the associations between the independent variable (post-cessation weight concerns) and dependent variable (intentions to quit smoking). The unadjusted odds ratio in the crude model did not control for any

Table 1. Characteristics of the study population (N=1037)

Characteristics	n	%
Age (years)		
<30	340	32.79
30	218	21.02
40	197	19.00
50	176	16.97
≥60	106	10.22
BMI (kg/m^2)		
<18.5	55	5.30
18.5–23.9	624	60.20
≥24	358	34.50
Race		
Han nationality	993	95.76
Ethnic minorities	44	4.24
Region		
Urban district	697	67.21
Villages and towns	340	32.79
Marital status		
Single	333	32.11
Married/living with partner	704	67.89
Education level		
Low	138	13.31
Medium	494	47.64
High	405	39.05
Monthly income[a] (in US$)		
<270	224	23.46
270–680	375	39.27
≥680	356	37.28
Age started smoking (years)		
<18	412	39.73
18–22	483	46.58
≥23	142	13.69
Smoking duration (years)		
≤10	352	33.94
>10	685	66.06
Nicotine dependence score, median (IQR)	3.00 (1.00–5.00)	
Cigarettes/day		
1–10	97	9.35
11–20	156	15.04
21–30	477	46.00
≥31	307	29.60
Intentions to quit smoking score, median (IQR)	5.00 (3.00–8.00)	
Smoking cessation attempts		
No	342	32.98
Yes	695	67.02
Number of smoking cessation attempts[b]		
1–5	621	89.35
>5	74	10.65
Weight gain in smoking cessation attempts[b]		
No	553	79.57
Yes	142	20.43
Maximum amount of post-cessation weight gain[c]**,** median (IQR)	5.00 (4.00–10.00)	
Controlling WEAQ, median (IQR)	7.67 (5.67–9.17)	

BMI: body mass index. WEAQ: weight efficacy after quitting smoking. IQR: interquartile range. a Data were missing for 82 individuals. b A total of 695 of the respondents had tried to quit smoking. c A total of 142 people gained weight in smoking cessation attempts.

variables. Adjusted odds ratio in Model 1 was adjusted for age, race, region, marital status, education level, occupation, income, and BMI. Adjusted odds ratio in Model 2 was additionally adjusted for age of starting smoking, smoking duration, nicotine dependence score, cigarettes, smoking cessation attempts, and controlling weight efficacy after quitting smoking. All analyses were performed in SPSS 25.0. An α level of $p<0.05$ was used to determine the level of statistical significance.

RESULTS

Sample characteristics

Table 1 shows the sample characteristics of the male smokers investigated in the cross-sectional study. In the survey, participants consisted of primarily Han nationality (95.76%), urban district (67.21%), married or living with a partner (67.89%), medium or high level of education (86.69%), and medium or high income (76.55%). Most of the subjects had a high level of smoking duration (>10 years, 66.06%). Almost half of the sample started smoking at an age of 18–23 years, while the proportion of those that started smoking at an age of <18 years or >23 years was 39.73% and 13.69%, respectively. More than

Table 2. The perception of weight gain after quitting smoking (N=1037)

Variable	n	%
Smoking cessation will affect the weight of smokers		
Agree	374	36.07
Neither agree nor disagree	151	14.56
Disagree	151	14.56
Don't know	361	34.81
Weight gain after smoking cessation belongs to withdrawal symptoms		
Agree	232	22.37
Neither agree nor disagree	148	14.27
Disagree	87	8.39
Don't know	570	54.97
Weight gain after smoking cessation will occur in some smokers		
Agree	307	29.60
Neither agree nor disagree	117	11.28
Disagree	78	7.52
Don't know	535	51.59
Weight gain will be rapid in the first three months after smoking cessation, then slow down and stabilize		
Agree	155	14.95
Neither agree nor disagree	112	10.80
Disagree	61	5.88
Don't know	709	68.37

half of the smokers (67.02%) had attempted to quit smoking before, and almost one-fifth (20.43%) had gained weight in an attempt. The BMI of the majority of participants (60.2%) was normal. The nicotine dependence score (score=3) was below the cutoff, reflecting a low-level of dependence on nicotine (score=6); on the contrary, the controlling weight efficacy after quitting smoking score (score=7.67) was above the cutoff, reflecting high efficacy (score=6).

The perceptions of post-cessation weight gain and post-cessation weight concerns

The perceptions of post-cessation weight gain are given in Table 2. Only 374 (36.07%) participants knew that 'smoking cessation will affect the weight'. Less than one-quarter of the sample (22.37%) knew that 'weight gain after smoking cessation belongs to withdrawal symptoms'. Those knowing 'weight gain after smoking cessation will occur in some smokers' and 'weight gain will be rapid in the first three months after smoking cessation, then slow down and stabilize' accounted for only 29.60% and 14.95%, respectively.

The 6-item scale that measured concerns about post-cessation weight gain is given in Table 3. Around 14.95% of the subjects reported no weight concerns (1 on a 10-point scale). The median scores of item 1 and item 5 were 3 and 2, respectively, while those of item 2, item 3, item 4, and item 6 were just 1. Notably, the median sum score of weight concerns derived from the six items was 2.16 (1.33–3.33). And only 8.29% of the participants had high post-cessation weight concerns (score ≥5 on a 10-point scale).

Table 4 displays the characteristics of subjects with different degrees of post-cessation weight concerns.

Table 3. The score of post-cessation weight concerns scale (N=1037)

Questions	Score Median (IQR)	Score ≥5 n (%)
1. How important is losing weight or maintaining your current weight compared with other personal health concerns?	3 (1–6)	448 (43.20)
2. People smoke for many reasons. Compared with all of your reasons for smoking, how important is smoking to control your weight?	1 (1–1)	56 (5.40)
3. How much do cigarettes help you to control your weight?	1 (1–2)	130 (12.54)
4. How concerned are you about gaining weight as a result of quitting?	1 (1–3)	168 (16.20)
5: How likely do you think it is that you will gain weight as a result of quitting?	2 (1–5)	301 (29.03)
6. How likely is it that you would go back to smoking after quitting if you gained too much weight?	1 (1–3)	202 (19.48)
Weight concerns score	2.16 (1.33–3.33)	86 (8.29)

IQR: interquartile range.

Table 4. Post-cessation weight concerns, lower degree versus higher degree (N=1037)

Characteristics	Post-cessation weight concerns		χ^2	p
	Lower degree (score ≤2.16) n (%)	Higher degree (score >2.16) n (%)		
Age (years)			37.77	<0.01
<30	176 (27.76)	164 (40.69)		
30	132 (20.82)	86 (21.34)		
40	118 (18.61)	79 (19.60)		
50	120 (18.93)	56 (13.90)		
≥60	88 (13.88)	18 (4.47)		
BMI (kg/m^2)			0.02	0.89
≤24	414 (65.30)	265 (65.76)		
>24.0	220 (34.70)	138 (34.24)		
Race			2.40	0.08
Han nationality	612 (96.53)	381 (94.54)		
Ethnic minorities	22 (3.47)	22 (5.46)		
Region			4.79	0.03
Urban district	410 (64.67)	287 (71.22)		
Villages and towns	224 (35.33)	116 (27.78)		
Marital status			23.58	<0.01
Single	168 (26.50)	165 (40.94)		
Married/living with partner	466 (73.50)	238 (59.06)		
Education level			24.67	<0.01
Low	263 (41.48)	119 (29.53)		
Medium	276 (43.54)	180 (44.66)		
High	95 (14.98)	104 (25.81)		
Monthly income[a] (in US$)			4.08	0.13
<270	131 (20.66)	93 (23.08)		
270–680	243 (38.33)	132 (32.75)		
≥680	260 (41.01)	149 (36.97)		
Age started smoking (years)			7.16	0.03
<18	249 (39.27)	163 (40.45)		
18–22	284 (44.80)	199 (49.38)		
≥23	101 (15.93)	41 (10.17)		
Smoking duration (years)			18.77	<0.01
≤10	183 (28.86)	169 (41.94)		
>10	451 (71.14)	234 (58.06)		
Cigarettes/day			15.54	<0.01
1–10	72 (11.35)	25 (6.95)		
11–20	97 (15.30)	59 (14.64)		
21–30	301 (47.48)	176 (43.67)		
≥31	164 (25.87)	143 (35.48)		
Smoking cessation attempts			4.65	0.04
No	225 (35.49)	117 (29.03)		
Yes	409 (64.51)	286 (70.97)		

Continued

Table 4. Continued

Characteristics	Post-cessation weight concerns		χ^2	p
	Lower degree (score ≤2.16) n (%)	Higher degree (score >2.16) n (%)		
Weight gain in smoking cessation attempts[b]			93.45	<0.01
No	376 (91.93)	177 (61.89)		
Yes	33 (8.07)	109 (38.11)		
Perception of smoking cessation will affect the weight of smokers			163.81	<0.01
Agree	138 (21.77)	236 (58.56)		
Neither agree nor disagree	360 (56.78)	152 (37.72)		
Disagree	136 (21.45)	15 (3.72)		

BMI: body mass index. a Data were missing for 82 individuals. b A total of 695 of the respondents had tried to quit smoking.

Table 5. Associations between post-cessation weight concerns and intentions to quit smoking (N=1037)

Model	OR (95% CI)	AOR (95% CI)	p
Crude model	1.39 (1.09–1.78)		0.01
Model 1		1.40 (1.07–1.83)	0.01
Model 2		1.47 (1.09–1.97)	0.01

Dependent variable: intentions to quit smoking. Independent variable: post-cessation weight concerns. Crude model: not controlled for any variables. AOR: adjusted odds ratio. Model 1: adjusted for age, race, region, marital status, education level, occupation, income, BMI. Model 2: adjusted as for Model 1 plus age of starting smoking, smoking duration, nicotine dependence score, cigarettes, smoking cessation attempts, controlling weight efficacy after quitting smoking.

Table 6. Logistic regression results of influencing factors for intentions to quit smoking (N=1037)

Variables	Model 2 AOR (95% CI)	p
Age (years)		0.15
<30 ®	1	
30	1.27 (0.72–2.24)	0.41
40	1.63 (0.84–3.17)	0.15
50	2.25 (1.12–4.49)	0.02
≥60	1.88 (0.82–4.33)	0.14
Race		
Han nationality ®	1	
Ethnic minorities	1.64 (0.83–3.24)	0.15
Region		
Urban district ®	1	
Villages and towns	1.02 (0.76–1.37)	0.90

Continued

Those with higher weight concerns (score ≤2.16) were younger, single, living in an urban district, had a high level of education, started smoking early, had shorter smoking duration but were heavy smokers, experienced weight gain in previous quit attempts, and knew more about post-cessation weight gain.

Associations between post-cessation weight concerns and intentions to quit smoking

Table 5 shows that post-cessation weight concerns are positively association with intention to quit smoking

Table 6. Continued

Variables	Model 2 AOR (95% CI)	p
Marital status		
Single ®	1	
Married/living with partner	0.99 (0.63–1.55)	0.96
Education level		0.87
Low ®	1	
Medium	0.90 (0.56–1.44)	0.65
High	0.86 (0.49–1.52)	0.61
Occupation		0.17
Government agency and public institution ®	1	
Workers and business service	1.11 (0.76–1.61)	0.60
Farmer	1.12 (0.52–2.42)	0.77
Unemployed	1.23 (0.73–2.06)	0.44
Retiree	0.40 (0.18–0.88)	0.02
Other workers	0.99 (0.50–1.97)	0.98

Continued

Table 6. Continued

Variables	Model 2 AOR (95% CI)	p
Monthly income[a] (in US$)		0.69
<270 ®	1	
270–680	1.14 (0.77–1.69)	0.50
≥680	1.20 (0.79–1.81)	0.40
BMI (kg/m^2)	0.96 (0.92–1.01)	0.11
Age started smoking (years)		0.08
<18 ®	1	
18–22	1.41 (1.03–1.93)	0.03
≥23	1.45 (0.89–2.35)	0.13
Smoking duration (years)		
≤10 ®	1	
>10	0.73 (0.44–1.20)	0.22
Nicotine dependence score	0.99 (0.91–1.07)	0.71
Cigarettes/day		0.38
1–10 ®	1	
11–20	1.21 (0.67–2.20)	0.53
21–30	1.13 (0.62–2.05)	0.69
≥31	1.58 (0.75–3.33)	0.23
Smoking cessation attempts		
No ®	1	
Yes	3.07 (2.24–4.19)	<0.01
Controlling weight efficacy after quitting smoking	1.12 (1.04–1.20)	<0.01
Post-cessation weight concerns		
Lower degree (score ≤2.16) ®	1	
Higher degree (score >2.16)	1.47 (1.09–1.97)	0.01

AOR: adjusted odds ratio. Model 2: adjusted for age, race, region, marital status, education level, occupation, income, BMI, age of starting smoking, smoking duration, nicotine dependence score, cigarettes, smoking cessation attempts, controlling weight efficacy after quitting smoking. ® Reference categories.

in the study population. In the crude model, Model 1 and Model 2, those with higher weight concerns (score ≤2.16) had a higher odds ratio for intentions to quit smoking (crude model: OR=1.39; 95% CI: 1.09–1.18; Model 1: AOR=1.40; 95% CI: 1.07–1.83; Model 2: AOR=1.47; 95% CI: 1.09–1.97, respectively) compared to participants with lower weight concerns (score ≤2.16). In addition to weight concerns, the age of starting smoking, smoking cessation attempts, and controlling weight efficacy after quitting smoking were influencing factors for intentions to quit smoking in Model 2 (Table 6).

DISCUSSION

We conducted the study to demonstrate the knowledge about post-cessation weight gain and post-cessation weight concerns in Chinese male smokers. The results showed that the levels of knowledge about post-cessation weight gain and post-cessation weight concerns were quite low in the population, and post-cessation weight concerns were positively associated with the intention to quit smoking in the study population.

The study found that 14.95% of the participants reported no weight concerns (1 on a 10-point scale), similar to other studies[33,34]. Nonetheless, only 8.29% of the participants had high weight concerns (≥5 on a 10-point scale) about quitting smoking, which was quite low compared to other study results, with over 50% concerns reported in female smokers and over 25% in male smokers of Western countries[20,22,35]. It may be related to the early development of health education on smoking cessation in Western countries. The perception level of post-cessation weight gain was higher in Western countries so the level of post-cessation weight concerns is higher. In contrast, the lower levels of cognition lead to lower post-cessation weight concerns in China.

Our findings showed that the perception level of post-cessation weight gain was also quite low; those knowing 'smoking cessation will affect the weight', 'weight gain after smoking cessation belongs to withdrawal symptoms', 'weight gain after smoking cessation will occur in some smokers' and 'weight gain will be rapid in the first three months after smoking cessation, then slow down and stabilize' accounted for only 36.07%, 22.37%, 29.6% and 14.95% of the studied population, respectively. Most of the participants thought that smoking cessation had nothing to do with weight gain. According to the 'peak of ignorance' in the Dunning-Kruger effect theory[36], the individuals with low ability or knowledge in a particular domain vastly overestimate their competence, which could partially explain the lower rate of post-cessation weight concerns in this population.

It is worth noting that a positive association between post-cessation weight concerns and intentions to quit smoking were presented in this study, regardless of no adjustment model and multiple variable adjustment model. Our findings were consistent with a study from

Sepinwall et al.[10]. Still, it was contrary to most previous studies, because post-cessation weight gain concern was generally viewed as a potential disadvantage factor for quitting smoking in Western countries[19,21,23]. The positive relationship is reasonable, since the general post-cessation weight concern level is low. Those with higher weight concerns in the study population were younger, single, living in urban districts, had a high level of education, started smoking early, with shorter smoking duration but heavy smokers, experienced weight gain in previous quit attempts, and had a higher perception of post-cessation weight gain. They are more likely to pay more attention to health and have higher intentions to quit smoking.

Although weight concerns were not a barrier to reduced intentions to quit smoking currently in male smokers from Chongqing, the largest city of China, weight concerns might affect intentions to quit with the improvement of cognitive level about weight gain after quitting smoking in the future. Large-scale investigations concerning the nationwide status of post-cessation weight concern and its relationship to smoking cessation, are needed in China, the largest market of tobacco in the world. In tobacco control interventions, it is necessary to increase the correct understanding of weight gain after quitting smoking. Proper diet and exercise interventions are needed to alleviate post-cessation weight gain.

Limitations

The present study is limited by its sites, selected from parks and squares. The sampling method used in this study is convenience sampling, and sample representativeness may not be as good as a sample from a multi-stage random survey. Another limitation is that this study is cross-sectional. Study with prospective data would have provided direct evidence of causality. Furthermore, residual confounding remains in this study. We have no data on participants' physical health, and there is a certain bias in precluding subjects with severe diseases based solely on self-reports.

CONCLUSIONS

Due, in part, to the poor perception of post-cessation weight gain, the extent of post-cessation weight concerns was low in male smokers in Chongqing, China. Since a positive correlation between post-cessation weight concerns and intentions to quit smoking has been reported, it appears that weight concerns have not been a significant deterrent to the intention of quit smoking among the participants in this study.

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Ethical approval was obtained from the Ethics Committee of Chongqing Medical University (Approval date: 7 June 2017). Participants provided informed consent.

DATA AVAILABILITY
The data supporting this research are available from the authors on reasonable request.

AUTHORS' CONTRIBUTIONS
TC: conceptualized and designed the study. YH, LW and YY: collected and organized the data. QZ, LP and LS: conducted the initial analyses. LW and YH: drafted the manuscript. TC and CD: supported the critical revision of the manuscript. All authors read and approved the final version of the manuscript.

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