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A 28-Day Challenge to Help Quit Smoking Using Telephone Follow-Ups Combined With the WeChat App

The Impact of the Humanistic Approach on Smoking Cessation

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Abstract

The study aims to assess the effectiveness of telephone follow-ups combined with a smartphone app (e.g., WeChat [Tencent], which is one of the most widely used communication apps in China), as a smoking cessation intervention. Social volunteers were recruited on March 1, 2017, and randomized to supervision groups with five participants in each group. Every day, the specialists shared some information related to smoking cessation including the videos, songs, and scientific knowledge in WeChat groups and conducted telephone follow-ups on the third, fifth, seventh, ninth, 12th, 17th, 22nd, 27th, and 30th day in March and on April 1. Ultimately, a comparison was made of the self-reported smoking abstinence and self-reported average number of cigarettes smoked between the participants. One hundred ten volunteers participated in the study, with 105 who completed follow-up. Self-reported smoking abstinence in the past 7 days occurred in 65.7% of the participants ($n = 69$) compared with 34.3% ($n = 36$) in whom smoking abstinence did not occur. The mean age of those who failed was 40.15 years (range: 22–70 years), and 55.5% ($n = 20$) attributed their failure to personal reasons. However, the self-reported average number of cigarettes smoked every day was less than that before the study (on average, 10.34 ± 8.17 per day), and this difference was statistically significant (95% CI [8.312, 12.364], $p < .01$). It was effective to deliver a telephone follow-up combined with a smartphone app follow-up as an intervention for smoking cessation.

Keywords: nicotine withdrawal, smartphone app, smoking cessation, smoking intervention, telephone follow-up

Smoking is one of the leading causes of diseases worldwide, and cigarette smoking is responsible for eight million deaths annually (World Health Organization, 2019). In China, health issues related to cigarette smoking increase every year; if effective interventions are not developed, the annual mortality rate owing to smoking will reach 2 million in 2030. Although various interventions have been adopted for smoking cessation (SC) over the past years (e.g., setting up SC clinics, adopting nicotine replacement therapy [Hartmann-Boyce et al., 2018], specialist advice, medical treatment [Cahill et al., 2016; Hughes et al., 2004], behavioral interventions [NHFPC, 2013], and even the use of traditional Chinese methods such as acupuncture therapy), most of them failed. High social and work pressure, lack of self-management skills and education of patients, and intolerance of withdrawal symptoms are believed to have contributed to this phenomenon. The effectiveness of some intervention methods has been investigated to reduce smoking. Many systematic reviews have reported the use of telephone follow-ups as an effective intervention for SC (Pan, 2006; Stead et al., 2003). However, previous studies have not confirmed the effectiveness of existing SC strategies and SC services in China (Gruder et al., 2013; Jiang et al., 2007).

The technology of the smartphone is convenient for our daily life. In China, smartphone subscribers are up to 1.29 billion from 2014 to 2015. Many applications are developed for health intervention. WeChat (Weixin), developed by the largest Chinese internet company Tencent, has been the most widely used communication app in China (Zeng et al., 2016). WeChat platform as a time-effective and cost-effective application will play an important role in patients' management and help improve patients' compliance (Lyu et al., 2016).

As reported, the symptoms of nicotine withdrawal always occur within the first 30 minutes of the last use of tobacco; these symptoms mainly include frustration, anxiety, headache, sweating, irritability, difficulty concentrating, increased appetite

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and weight gain, restlessness, and impaired memory (Heishman et al., 2010). The symptoms peak on approximately the third day and taper off during the following 3–4 weeks. During the first 2 weeks, smokers' craving is the most prominent reason for smoking relapse (Shiffman & Perguson, 2008); these symptoms will be relieved 4 weeks later, and after then, withdrawal effects mainly focused on the psychological aspect. Thus, our activities persisted for 4 weeks.

The main purpose of our study was to investigate the effectiveness of the telephone follow-ups combined with the smartphone app (e.g., WeChat [Tencent]) intervention for SC. This study will provide new insights into SC in clinical practices. To stimulate participants' interest, this activity is named as the "28-day challenge match."

METHOD

Participation

Social volunteers were recruited on March 1, 2017. The eligibility criteria included (a) 18 years old or older, (b) willing to quit smoking but previously failed, (c) score of nicotine dependence ≥1, and (d) owning a smartphone and can proficiently use the WeChat app. Lactating and pregnant women were excluded.

Intervention

The specific process is as follows: (a) Initially, all the participants filled out a survey form about their basic information, including name, gender, age, educational level, occupation, time of smoking, average number of cigarettes smoked per day, and score of nicotine dependence, which was measured by the Fagerstrom test. (b) All eligible participants received specialized training; the specialists educated them on the importance of SC and provided tips to relieve nicotine withdrawal symptoms, to strengthen their motivation and perseverance. (c) WeChat groups were set up, with five randomized participants in each group, which was supervised by one specialist. In the WeChat groups, the specialists shared information on SC including the videos, songs, messages, and scientific knowledge regularly. All the participants could also consult SC-related questions from the specialist and discussed it with each other at any time. (d) Telephone follow-ups were conducted among all participants on the third, fifth, seventh, ninth, 12th, 17th, 22nd, 27th, and 30th day in March; each call lasted more than 5 minutes. All specialists, who were respectively in charge of supervision groups, participated in an SC training program. During the call, specialists consulted every participant about their symptoms, provided problem-oriented suggestions and advice, and also encouraged the participants to maintain abstinence, which increased participants' confidence to quit smoking. The process did not include any medical treatment. (e) On April 1, the last telephone follow-up was finished to calculate the quit rate.

Questionnaires were distributed, and the nicotine dependence of those who failed was evaluated.

Questionnaire Information The evaluation included three types of anonymous questionnaires.

The information of all the participants included (a) the main withdrawal symptom (light-headedness, memory impairment, dysphoria, lethargy, and hunger); (b) most effective methods that help relieve nicotine withdrawals, namely, announcing self-willingness, holding on with willpower, receiving information on SC and physician's instruction, throwing away everything that may provoke smoking (e.g., smoking set), doing sports, eating alternative foods (e.g., gum), staying away from smokers, talking to members in the SC group in WeChat, and receiving family support; and (c) places provoking smoking impulse: workplace, home, dining room, KTV, internet bar, bath center, and public transportation (e.g., taxi).

The information on those successes included (a) educational level and occupation; (b) most useful intervening materials, namely, cartoons and books, contents and preventive information in chat groups, posters, songs and square dancing, mutual encouragement in SC chat groups, and none of the above; and (c) phase with the most serious withdrawal symptoms.

The information on those failures included (a) the main reason for the failure, namely, disturbance by other smokers, environmental disturbance, personal reasons, SC intervention not in place, scarce promotion regarding SC in cities, and others, and (b) number of daily cigarettes smoked after the intervention although the quitting failed.

Primary Outcome

The self-reported SC rate was assessed by 7-day point prevalence smoking abstinence. The participants were considered "successful" quitters if they reported they did not smoke cigarettes or even one puff in the last 7 days. Otherwise, they will be considered as "failure."

Secondary Outcomes

The following are the secondary outcomes:

(1) Effective methods for smoking abstinence
(2) Education experience and occupation for those successes
(3) Specific propaganda materials are most useful in SC.
(4) Main withdrawal symptoms during the SC period
(5) Main reasons for failure
(6) Differences in the average number of cigarettes smoked per day before and after this intervention for those reported failures
(7) Places that stimulate the impulse of smoking relapse

Data Analysis

All data were analyzed using the SPSS Software Version 16. The outcome was assessed based on the number of participants who started smoking abstinence during the follow-up. Quantitative variables were presented as mean ± standard deviation (*SD*). The difference before and after the intervention for all the failures was investigated, and a *t* test was performed to compare the mean numbers. *p* Value was calculated using a two-sided approach, in which the value less than .05 was considered to be statistically significant.

OUTCOME

One hundred ten volunteers participated in this study; there were more men ($n = 103$) than women ($n = 7$). One hundred

TABLE 1 Overall Questionnaire of All Participants

	n	Proportion
Main withdrawal symptom		
Light-headedness	13	18.8%
Impaired memory	6	8.7%
Dysphoria	19	27.5%
Lethargy	14	20.3%
Hunger	9	13.1%
Others	8	11.6%
Methods to relieve nicotine withdrawals		
Announce self-willingness	11	10.5%
Hold on with willpower	27	25.7%
Receive information related to smoking cessation and physician's instruction	11	10.5%
Drop all things (e.g., smoking set) that can provoke smoking behavior	8	7.6%
Keep on sporting	8	7.6%
Eat alternative foods (e.g., gum)	8	7.6%
Stay away from smokers	10	9.5%
Talk to smoking cessation group members in WeChat	12	11.4%
Be accompanied by family	9	8.6%
Others	1	1%
Places that lead to the impulse of smoking		
Workplace	36	34.3%
Home	17	16.2%
KTV	14	13.3%
Dining room	28	26.7%
Internet bar	0	0.0%
Bath center	1	0.9%
Public transportation (e.g., taxi)	1	0.9%
Others	8	7.7%

five participants completed follow-up, with five lost to follow-up. At the end of the intervention, 65.7% of the participants ($n = 69$) reported that they successfully quit smoking, whereas 34.3% ($n = 36$) failed.

Among all participants, 27.5% ($n = 19$) stated that the main withdrawal symptom during the process was dysphoria, and 25.71% ($n = 27$) tended to relieve nicotine withdrawals with willpower. In their daily life, the workplace served as the most sensitive place that induced the impulse of smoking ($n = 36$, 34.3%; see Table 1).

The mean age of those successes was 41.07 years (range: 20–72 years), most of them had an undergraduate college degree ($n = 55$, 79.7%), 47.8% ($n = 33$) were enterprise or business staff, and 59.4% ($n = 41$) stated that the mutual encouragement in WeChat groups was the most effective intervention for SC (see Table 2).

The mean age of those failures was 40.15 years (range: 22–70 years); 55.5% ($n = 20$; see Table 3) owned their failure for personal reasons. However, the average amount of consumed cigarettes per day was less than that before the study (on average, 10.34 ± 8.17), and this difference was statistically significant (95% CI [8.312, 12.364], $p < .01$; see Table 4).

DISCUSSION

This 28-day challenge match that adapted telephone follow-up combined with WeChat apps was initiated by our department in China. The participants displayed a great interest in this activity because it was very engaging. Specifically, in this activity, the participation rate was up to 95.4% (only five participants were lost); the quit rate was up to 65.7%, which indicated that this intervention is a feasible and effective way to deliver SC. The positive result can be attributed to three factors: participants' adherence, specialists' humanistic care, and technological assistance.

TABLE 2 Outcome of Successes

	n	Proportion
Educational experience		
None	0	0.0%
Elementary school	1	1.5%
Junior high school	3	4.3%
Senior high school	9	13.0%
Undergraduate	55	79.7%
Postgraduate and above	1	1.5%
Occupation		
Government and public institution staff	8	11.6%
Enterprise/business staff	33	47.8%
Teacher	10	14.5%
Medical staff	10	14.5%
Student	0	0.0%
Retired employee	8	11.6%
Others	0	0.0%
Most useful intervening material		
Cartoons and books	5	7.2%
Contents and preventive information in chat groups	15	21.7%
Posters	6	8.7%
Songs and square dancing	0	0.0%
Mutual encouragement in smoking cessation chat groups	41	59.4%
None	2	3%

TABLE 3 Outcome of Failures

Main Reason for Failure	*n*	Proportion
Disturbed by other smokers	4	11.1%
Environmental disturbance	8	22.2%
Personal reasons	20	55.5%
Smoking cessation intervention not in place	1	2.8%
Scarce promotion regarding smoking cessation in cities	1	2.8%
Others	2	5.6%

Most participants who failed at SC owned their failure for personal reasons (55.55%); we conclude that self-control and willpower serve as primary factors in SC. It is generally acknowledged that the traditional Chinese culture emphasizes the value of willpower in guiding people's behaviors; and most Chinese people tend to overcome any barriers through their strong endurance and willpower, which is confirmed by this study.

Moreover, the specialists expressed their humanistic care to all participants with respect, understanding, guidelines, and support (Evans, 2008). Humanistic care, which is based on the principle of "relieve often and comfort always," is an important component in the current biological–psychological–social medicine model. Specifically, the significance of humanistic care is emphasized during the SC process of this activity. Smokers lack confidence, durance, and willpower, although they are eager to quit smoking. Health professionals and nurses provide additional emotional and technological support and help in the form of text message, feedback, and video, thus showing their concern and company. It indicated that showing humanistic care is time consuming during SC. However, we stressed its positive influence for the psychological state of quitters, which is considered crucial for success.

To be more specific, during this study, 27.5% of the participants stated that they had symptoms of dysphoria, whereas others showed symptoms of light-headedness, memory impairment, and lethargy. With the supervision via telephone follow-ups and WeChat groups by our specialists, all the participants were suggested to do something to dismiss this temporary feeling: The participants were encouraged to exercise, listen to the music, and chat with their family and peers. Typically, nicotine cravings persist for only 15–20 minutes, withdrawal is not harmful to health, and these symptoms will be relieved over time. By providing attention, care, and professional guidance, a good relationship was established between the specialists and the smokers, which improves the reliance on and trust of participants in the specialists as well as the overall quitting rate. Besides, during our activity, each specific group included five participants and was supervised by a specific specialist; these specialists shared information related to SC (e.g., videos, songs, and scientific knowledge) in WeChat groups every day, to encourage the participants to overcome the withdrawal symptoms. We believe that the humanistic approach was essential in helping the participants to quit smoking.

Thus, it can be concluded that the WeChat app is also essential. In China, half of the population owns a smartphone regardless of age (China Internet Network Information Center, 2019). In the United States, complicated apps have been used by some health care programs including programs on SC (Haug et al., 2009; Obermayer et al., 2004). However, owing to objective reasons (e.g., cost and complicated technology), these approaches are not widely used in China. The WeChat app is a free communication platform that is very popular in daily life; it allows participants to communicate with each other in the WeChat groups and consult the specialists for support during the process. The questionnaire results showed that 11.4% of the total participants stated that their withdrawal symptoms were relieved by talking to SC group members, which is second only to self-control (25.71%). In addition, all smokers in the study could seek help and guidance from the specialist in the WeChat group; the participants were encouraged to share their experiences, which improved their determination and confidence in quitting smoking. Thus, the free communication app contributed to quitting smoking during our study.

Furthermore, the environment is essential to smoking relapse. As our surveys showed, most of the participants (34.3%) had an impulse to smoke at the workplaces where they felt excessively mentally and psychologically stressed, which easily induced the staff to smoke. Hence, most participants consumed cigarettes to reduce stress and improve their performances; the participants were also affected by other smokers at the workplace. This result indicates that effective workplace-based interventions will improve the overall SC rate of the country. Several articles have reported the effectiveness of SC in the workplace (Cahill et al., 2014; Hennrikus et al., 2002; Sala et al., 2005; Tanaka et al., 2006). However, in China, there are no relevant laws and regulations on employees smoking at the workplace. Some strategies (e.g., smoke-free workplace policies, nonsmoker hiring policies, strengthening the surveillance and penalty for disobeying smoke-free ordinances at the workplace) should be implemented in social SC programs. Overall, a nonsmoking environment contributes to quitting smoking (Borland et al., 1991).

TABLE 4 Cigarettes Consumed per Day Before and After the Intervention for Failures (N = 36)

Baseline (Mean ± *SD*)	Poststudy (Mean ± *SD*)	Reduction (Mean ± *SD*)	*t*	95% CI	*p* Value
20.48 ± 9.67	10.14 ± 6.27	10.34 ± 8.17	10.194	8.312, 12.364	.000

We identified that most participants who successfully quit smoking were enterprise or business staff (47.8%), most of whom had an undergraduate college degree (79.7%). The well-educated groups are aware of the negative effects of smoking and have good knowledge of the risk of tobacco to health (Yang et al., 2011). Hence, providing efficient counseling programs, improving smokers' awareness, and having subjective initiative may help more smokers to quit smoking.

During the study, although approximately 34.3% ($n = 36$) of the participants failed to quit smoking, the number of consumed cigarettes after the study was significantly less than that before the study (on average, 10.34 ± 8.17 cigarettes per day; $p < .01$), which was beneficial to those who failed at SC. If this approach is implemented monthly, it will help reduce the number of smokers by 50% every year. It is an exciting claim.

SC is a complicated process that requires physical and mental resources as well as an appropriate environment for the smokers. Meantime, smokers' craving included physical and psychological craving; physical craving will decrease after 4 weeks, whereas psychological craving will last longer, even for a lifetime. Continuing to provide multidisciplinary supports coming from SC specialists, health care clinicians, and pharmacists for smokers will be needed in the future. This approach may help policymakers and physicians to design better SC programs in the future. Our 28-day challenge indicated the feasibility and acceptability of this type of intervention. A telephone follow-up combined with a smartphone app provides a new direction for future SC approaches.

LIMITATIONS

There were some limitations in our study. First, the outcome overly relied on self-reported data on abstinence, without a biochemical confirmation. Second, the sample size was small; thus, future large-scale studies are necessary to assess the effectiveness of this model. Third, all questionnaires were designed by us based on personal experiences and lacked uniform principles to assess validity. Owing to the difference in race, culture, and educational background, this model was only applied in our region; thus, future studies should be conducted in other regions or countries.

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