Instant messaging applications to promote smoking cessation in smokers with chronic diseases: abridged secondary publication

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KEY MESSAGES

1. Instant messaging applications are a potentially effective option to deliver brief motivational interviewing to help smokers with chronic diseases quit smoking.
2. Delivery of brief motivational interviewing through instant messaging applications is more cost-effective than through face-to-face meetings.
3. The biochemically validated abstinence rate at 12 months is higher (but not significantly) in the intervention than control group (16.7% vs 6.7%, P=0.23).

Hong Kong Med J 2023;29(Suppl 2):S22-4
HMRF project number: 16172831

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Introduction

Cigarette smoking accounts for 8 million deaths worldwide every year.[1] Smoking may cause development of chronic diseases including cardiovascular disease, chronic respiratory disease, cancer, and diabetes. Smoking is associated with physical inactivity, unhealthy diet, and alcohol consumption.[2,3] Individuals with an intention to improve their health are more likely to engage in desirable health-related lifestyle practices and progress to other healthy practices.[4,5] This study aims to determine the effectiveness of instant messaging applications to deliver brief motivational interviewing (MI) to help smokers with chronic diseases quit smoking.

Methods

Hong Kong smokers with chronic diseases aged ≥18 years who were followed up in a special out-patient clinic were invited to participate. Those who had no intention to quit smoking (pre-contemplation stage) but were willing to take action to promote health and who were able to use WhatsApp or WeChat and willing to receive health promotion advice were included. Those currently participating in or accessing in other smoking cessation programmes or services were excluded.

Participants were asked about the priority of engaging in any desirable health-related lifestyle practice by a trained nurse (ie, smoking reduction or quitting, regular physical activity, healthy diet, and reduced alcohol consumption). Participants were asked to state a goal that they perceived as the easiest to achieve. Participants were randomly assigned to either the intervention or control group. Those in the control group received a self-help smoking cessation booklet alone, whereas those in the intervention group received an individual face-to-face brief MI (about 5 minutes) with generic health advice on selected health-related lifestyle practice and repeat brief MI messages via WeChat or WhatsApp by the nurse, in addition to a self-help smoking cessation booklet. The brief MI messages were delivered more intensively depending on the participant's responses (usually not less than once per 2 to 3 days and no more than 2 times per day) for the first 6 months.

Participants were assessed at baseline and at 1, 3, 6, and 12 months. The primary outcome measure was biochemically validated 7-day point prevalence of smoking abstinence at 12 months (defined as saliva cotinine level of <115 ng/mL and a carbon monoxide level in expired air of <9 parts per million). Secondary outcome measures were self-reported 7-day point prevalence of smoking abstinence at 6 and 12 months, self-reported reduction of ≥50% in cigarette consumption at 6 and 12 months, and any behavioural change at 6 and 12 months.

Results

Between 1 June 2019 and 17 July 2020, 82 eligible smokers with chronic diseases attended the special out-patient clinic. Of them, 51 men and 9 women (mean age, 46.2±11.1 years) agreed to participate. Their mean years of smoking and daily cigarette consumption were 25.0±11.0 and 13.5±7.4, respectively. 31 participants had multimorbidity; 54 participants had moderate to severe nicotine dependency; and 52 participants had no previous

attempts to quit. The intervention (n=30) and control (n=30) groups were comparable at baseline (Table 1).

All participants completed the 1-month follow-up; 42 (70%) participants completed the 3-month follow-up; 50 (83.3%) participants completed the 6-month follow-up; and 43 (71.7%) participants completed the 12-month follow-up.

Biochemical validation was performed for seven participants who self-reported abstinence at 12 months. The intervention group had a higher (but not significantly) biochemically validated abstinence rate at 12 months than the control group (16.7% vs 6.7%, P=0.23, Table 2), with an adjusted odds ratio of 2.4 (P=0.32) after adjusting for age, sex, educational attainment, marital status, employment status, year of smoking, and nicotine dependency. After excluding self-reported quitters, the intervention group had a higher self-reported reduction of ≥50% in daily cigarette consumption at 6 months than the control group (84.6% vs 51.7%, P=0.01), with an adjusted odds ratio of 7.20 (P=0.03). The intervention group had a higher percentage of reported intention to quit at 6 months than the control group (80.1% vs 37.9%, P=0.001) and 12 month (80% vs 50%, P=0.02). More than 80% of participants in the intervention group actively communicated with us via WhatsApp or WeChat.

TABLE 1. Characteristics of participants at baseline

Characteristic	Intervention (n=30)*	Control (n=30)*	P value
Age, y	44.3±10.2	48.1±12.0	0.22
Sex			0.72
Male	25 (83.3)	26 (86.7)	
Female	5 (16.7)	4 (13.3)	
Educational attainment			0.94
Primary or below	4 (13.3)	5 (16.7)	
Secondary	22 (73.3)	21 (70.0)	
Tertiary	4 (13.3)	4 (13.3)	
Marital status			0.79
Single	12 (40.0)	11 (36.7)	
Married	18 (60.0)	19 (63.3)	
Employment status			0.37
Employed	24 (80.0)	21 (70.0)	
Unemployed or retired	6 (20.0)	9 (30.0)	
Diagnosis			0.64
Cardiovascular diseases	6 (20.0)	8 (26.7)	
Cancer	1 (3.3)	0	
Chronic respiratory diseases	6 (20.0)	3 (10.0)	
Diabetes	2 (6.7)	3 (10.0)	
Multiple chronic diseases	15 (50.0)	16 (53.5)	
Duration of smoking, y	23.1±9.7	26.9±12.3	0.18
Daily cigarette consumption	13.5±7.0	13.5±7.7	0.97
Nicotine dependency			0.54
Mild, 0-3	2 (6.7)	4 (13.3)	
Moderate, 4-5	10 (33.3)	7 (23.3)	
Severe, 6-10	18 (60.0)	19 (63.3)	
Previous quit attempts			1.0
Yes	4 (13.3)	4 (13.3)	
No	26 (86.7)	26 (86.7)	

* Data are presented as mean±standard deviation or No. (%) of participants

Discussion

Smokers with chronic diseases have a long smoking history, relatively high nicotine dependency with no previous attempts at quitting. They are less likely to be affected by the current tobacco-control interventions or policies. In the present study, the biochemically validated abstinence rate at 12 months was higher (but not significantly) in the intervention than control group (16.7% vs 6.7%, P=0.23). The non-significant difference may be attributable to the relatively small sample size. A larger randomised controlled trial is warranted to determine the effectiveness of using instant messaging applications to brief MI to help smokers with chronic diseases quit smoking.

According to the World Health Organization, mobile health is defined as medical and public health practice supported by mobile devices. It is a new strategy to promote health. Instant messaging applications have been increasingly used for health promotion and treatment compliance. Nurses can offer real-time interactions to provide continuous professional advice and personalised support to patients to help them quit smoking and overcome withdrawal symptoms or cravings. Instant messaging applications are more flexible, efficient, and time-saving than face-to-face meetings. A meta-analysis of the use of mobile phone–based interventions for smoking cessation reported that smokers who received instant messages via mobile phones were approximately 1.7 times more likely to abstain from smoking than those who received conventional face-to-face cessation services.

Funding

This study was supported by the Health and Medical Research Fund, Health Bureau, Hong Kong SAR Government (#16172831). The full report is available from the Health and Medical Research Fund website (https://rfs1.fhb.gov.hk/index.html).

Disclosure

The results of this research have been previously published in:

TABLE 2. Comparisons of outcomes in the intervention and control groups

Variable	Intervention group (n=30)	Control group (n=30)	P value	Crude odds ratio (95% confidence interval)	P value	Adjusted odds ratio (95% confidence interval)	P value
	No. (%) of participants						
Biochemically validated 7-day point prevalence of smoking abstinence at 12 months	5 (16.7)	2 (6.7)	0.23	3.39 (0.57-20.10)	0.23	2.4 (0.43-13.75)	0.32
Self-reported 7-day point prevalence of smoking abstinence							
At 6 months	4 (13.3)	1 (3.3)	0.35	4.46 (0.47-42.51)	0.19	6.23 (0.62-62.94)	0.12
At 12 months	5 (16.7)	2 (6.7)	0.23	3.39 (0.57-20.10)	0.23	2.4 (0.43-13.75)	0.32
Self-reported reduction of ≥50% in cigarette consumption (excluding self-reported quitters)							
6 months	22/26 (84.6)	15/29 (51.7)	0.01	5.13 (1.41-18.66)	0.01	7.20 (1.22-42.44)	0.03
12 months	19/25 (76.0)	15/28 (53.6)	0.09	2.74 (0.84-8.94)	0.09	3.27 (0.95-11.32)	0.06
Self-reported behaviour change							
6 months	12 (40.0)	9 (30.0)	0.54	1.43 (0.46-4.42)	0.54	1.28 (0.31-5.27)	0.74
12 months	17 (56.7)	15 (50.0)	0.61	1.31 (0.47-3.62)	0.61	1.09 (0.35-3.40)	0.88

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Acknowledgements

We thank Ms Lau Man-man and Ms Ho Long-kwan for assistance in data collection, data entry, data analysis, and report writing.

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