



Brief Report

The Potential Effectiveness of COVID-Related Smoking Cessation Messages in Three Countries

Simone Pettigrew PhD¹, Min Jun PhD¹, Ian Roberts PhD², Kellie Nallaiah MPH¹, Chris Bullen PhD^{3,○}, Anthony Rodgers PhD¹

¹The George Institute for Global Health, University of New South Wales, Sydney, NSW, Australia; ²London School of Hygiene and Tropical Medicine, London, UK; ³National Institute for Health Innovation, University of Auckland, Auckland, New Zealand

Corresponding Author: Simone Pettigrew, PhD, The George Institute for Global Health, University of New South Wales, 1 King St, Newtown, 2042, New South Wales, Australia. Telephone: +61 2 8052 4624; E-mail: spettigrew@georgeinstitute.org.au

Abstract

Introduction: Health authorities are advising smokers to quit to reduce their COVID-related risk. The types of messages that may be effective in alerting smokers to this risk and encouraging a quit attempt are unknown. The aim of this study was to test a series of messages to identify potentially effective communication approaches.

Methods: An online survey was completed by 1509 smokers across three countries (Australia: $n = 604$; New Zealand: $n = 304$; United Kingdom: $n = 601$) in April–May 2020. Respondents were randomly assigned to view just one of four quit messages, two of which explicitly referred to the coronavirus, one referred to risk of chest infection, and one encouraged cessation for financial reasons. Outcome variables included quit intentions, further information seeking, message perceptions, and health and financial concerns.

Results: All four messages were associated with significant differences in the proportions of respondents intending to quit within the following 2 wk (increase range: 11%–34%) and with substantial proportions of respondents electing to access additional information (range: 37%–50%). The differences in intentions were significantly larger for the two health-related messages that specifically mentioned the coronavirus. All messages were perceived favorably in terms of acceptability, believability, effectiveness, and personal relevance. Negligible differences in health and financial concerns were observed.

Conclusions: Smokers in Australia, New Zealand, and the United Kingdom appear likely to be receptive to messages about their COVID-related risk. Such messages have the potential to increase quit intentions and prompt information-seeking behaviors.

Implications: The COVID-19 pandemic represents an opportunity to encourage smokers to quit to reduce both their COVID-related risks and their risks of a broad range of noncommunicable diseases.

Introduction

Although the status and the specific nature of the relationship between smoking and the risk of contracting and surviving COVID-19 remains unresolved, the evidence to date is considered strong enough to warrant an increased focus on promoting smoking cessation at

this time.^{1–3} As a result, health authorities around the world are encouraging smokers to quit to improve their chances of surviving an infection (eg, Public Health England,⁴ the Australian Medical Association,⁵ and the New Zealand Ministry of Health).⁶

The COVID-19 pandemic constitutes a new environment for smoking cessation messaging due to heightened health concerns in

the community that may have implications for how smokers react to quit messages. Evidence is emerging that smokers may be especially receptive to quitting during the pandemic,⁷ indicating that this is an opportune time to implement cessation campaigns. As well as potentially providing smokers with protection against adverse COVID-19 outcomes, quitting can reduce the risk of many smoking-related noncommunicable diseases that continue to account for a much larger proportion of deaths than COVID-19.⁸

Previous research has assessed various approaches to quit smoking messages, including the use of strong fear appeals, the provision of “how to quit” tips, criticizing the tobacco industry, and reminding smokers of the costs associated with smoking.^{9,10} Overall, “hard-hitting” messages featuring fear appeals relating to the effects of smoking on physical health have been found to be most effective in encouraging cessation^{9,10}; however, the extent to which this approach would be effective in the current context of a global pandemic is unknown.

To provide insights into this issue, the aims of the present study were to (1) ascertain smokers’ receptiveness to quit smoking messages during the pandemic and (2) test different methods of framing quit messages to identify approaches that may be most effective at this time. The primary effectiveness measures were seeking additional information on smoking-related COVID risks and changes in quit intentions. Information seeking was a key outcome due to its role as an important step in decisions to enact health-related behaviors.¹¹

The study was conducted in three countries of similar cultural heritage and tobacco control contexts: Australia (current smoking rate of 11%¹²), New Zealand (13%¹³), and the United Kingdom (14%¹⁴). According to international data clearinghouses (eg, “Our World in Data” and “Worldometers”), estimated cumulative COVID death/cases at the time of data collection in each country were approximately: Australia: 65/6700, New Zealand: 21/1150, and United Kingdom: 14100/97050.

Methods

In consultation with various health agencies, three health-related messages were developed for testing that varied in the extent to which they were likely to make people feel alarmed and worried (ie, intensity of the fear appeal), references to individual health and/or health system consequences, and explicit versus implied reference to COVID-19:

Message 1: Quit now—it’s never too late. Smoking damages your lungs so they don’t work as well. This means smokers are more likely to have severe complications if infected by the coronavirus.

Message 2: By quitting now, you can reduce your chances of experiencing complications from the coronavirus if you become infected. This will help our over-stretched health services to cope with the huge increase in patients.

Message 3: There has never been a better time to quit, no matter your age. Your lungs are healthier after a few days and within a month you will reduce your risk of chest infection.

To provide a point of comparison, a fourth message with a financial focus was tested:

Message 4: Times ahead may be tough financially for many people—quitting now is a great way to start saving money.

An international ISO-accredited web panel provider (Pureprofile) was commissioned to recruit 600 adult smokers in Australia, 300 in New Zealand, and 600 in the United Kingdom during April and

May 2020. Smoking status was defined as smoking at least one cigarette per day or seven per week.¹⁵ The smaller New Zealand sample reflects the country’s population of just five million. Respondents completing the survey received remuneration equivalent to AU\$3–4.

An online variation of the ad test procedure¹⁵ was used, which involved randomly exposing respondents to view just one of the four messages and asking a series of questions relating to message acceptability, believability, personal relevance, and perceived effectiveness (5-point response scales: “Not at all acceptable/believable/relevant/effective” to “Very acceptable/believable/relevant/effective”). Respondents also rated the messages according to the extent to which they made them feel alarmed and worried (4-point response scales: “Not at all,” “A little,” “A moderate amount,” “A lot”).

Prior to and after message exposure, respondents reported their current quit intentions on a 5-point stages of change scale,¹⁶ with time periods modified to reflect the urgency of the COVID epidemic (response options: “Trying to quit now,” “Within the next two weeks,” “Within the next two months,” “At some time in the future,” “Not at all”). Current levels of concern relating to physical health, mental health, and financial security were also measured on five-point scales (“Not at all concerned” to “Very concerned”). After message exposure, respondents were given the opportunity to access additional information about the relationship between smoking and COVID-19 in the form of an online fact sheet (sourced from www.quit.org.au). Accessing this information constituted a behavioral outcome measure (Yes/No). Finally, respondents were asked to report how much they had already heard about the risks of the coronavirus for smokers prior to taking part in the survey (4-point response scale: “Nothing at all,” “A little bit,” “A moderate amount,” “A lot”).

Descriptive analyses were conducted to assess the performance of the four messages on the perception, attitude, and behavior measures for each country and across the entire sample. Paired *t*-tests (pre- and post-message exposure attitudinal outcome comparisons within each message type), Kruskal–Wallis test (message perception comparisons), chi-square tests (behavioral outcome comparisons), and ANCOVA (attitudinal outcome comparisons across message types) were used to determine whether there were statistically significant differences between the four message groups and three countries. A two-sided *p*-value of <.01 was considered statistically significant to account for multiple comparisons. Analyses were performed using Stata 11.2.

Results

In total, 1509 smokers completed the survey: 604 from Australia, 304 from New Zealand, and 601 from the United Kingdom. Across the total sample there was an even gender split, a mean age of 46 years, and an average smoking history of 26 years (see [Table 1](#); [Supplementary Table S1](#) provides the sample profile by message condition). Around half (51%) of respondents reported that they had heard little or nothing about COVID-19 risks for smokers prior to participating in the survey. There were some differences in sample profiles by country. The New Zealand sample was somewhat younger (mean age 43 years vs 46 years for Australia and 47 years for the United Kingdom), with a correspondingly shorter average smoking history (22 years vs 26 years for Australia and 27 years for the United Kingdom). A substantially larger proportion of New Zealand respondents intended to quit smoking immediately or in the next two weeks (42%) compared with the Australian and UK samples (both 29%).

Table 1. Sample Profile

	Australia (<i>n</i> = 604)	New Zealand (<i>n</i> = 304)	United Kingdom (<i>n</i> = 601)	Total (<i>n</i> = 1509)
Gender, male: <i>n</i> (%)	291 (48.1)	164 (53.9)	306 (50.9)	761 (50.4)
Age				
45+ y, <i>n</i> (%)	299 (49.5)	124 (40.7)	336 (55.9)	759 (50.3)*
Mean years, SD	45.7 (16.6)	43.3 (14.5)	47.3 (14.1)	45.8 (15.3)*
Years smoking, mean (SD)	25.7 (17.1)	22.2 (16.0)	26.9 (15.1)	25.5 (16.2)*
Baseline quit intentions, <i>n</i> (%)				
“Trying to quit now” or “Within the next two weeks”	174 (28.8)	129 (42.4)	173 (28.7)	476 (31.5)*
“Within the next two months” or “At some time in the future”	325 (52.8)	144 (47.4)	309 (51.4)	778 (51.6)
“Not at all”	105 (17.4)	31 (10.2)	119 (19.8)	255 (16.9)*
Heard “nothing at all” or “a little bit” about Covid-19 risks for smokers, <i>n</i> (%) ^a	330 (54.6)	134 (44.0)	303 (50.4)	767 (50.8)

^aFour-point response scale: Nothing at all, A little bit, A moderate amount, A lot.

*Significant difference at $p < .01$ between countries.

Mean scores for each of the four messages were above the neutral scale midpoint of “3” for acceptability (range 3.9–4.1), believability (range 3.9–4.1), personal relevance (3.6–4.0), and perceived effectiveness (3.3–3.5) (Table 2). There were no significant differences in scores on these variables between messages, except for personal relevance for which the financial message scored significantly lower than two of the health-related messages (Message 1 and Message 3). Alarmed and worried scores were significantly higher for the messages that made explicit reference to the coronavirus (Messages 1 and 2) than those that did not (Messages 3 and 4) (Table 2).

Across the total sample, 32% of respondents reported that at the time of commencing the survey they were intending to quit within the next 2 wks, increasing to 38% at survey completion. All four messages were associated with significant pre–post increases in quit intentions: exposure to Message 1 was associated with a 23% increase in the number of respondents reporting an intention to quit immediately or within the next 2 wk, Message 2 with an increase of 34%, Message 3 with an increase of 14%, and Message 4 with an increase of 11%. Pairwise comparisons of means showed that Messages 1 and 2 produced significantly larger increases in quit intentions compared with Messages 3 and 4 (Table 2).

In almost all cases, the changes in concerns after message exposure were negligible and nonsignificant, with the exception of a small increase in physical health concerns among respondents exposed to Message 1 (pre–post increase of 0.09 on the 5-point scale). There were no significant differences in changes in physical, mental, or financial concerns across the four message conditions (Table 2).

Overall, 44% of respondents used the provided link to access additional information about COVID-19 risks for smokers. The access rate was substantially lower for Message 1 (37%) compared with the other three message conditions (44%–50%), although only the difference between Message 1 and Message 4 reached statistical significance. There were no significant differences between message conditions by country on any of the assessed measures.

Discussion

The results of the present study indicate that smokers in Australia, New Zealand, and the United Kingdom are likely to be generally receptive to messages about their smoking-related COVID-19 risk and that such messages have the potential to increase quit intentions and prompt information-seeking behaviors. All four messages stimulated information seeking and produced favorable changes in quit

intentions, suggesting they could be part of a suite of messages used in smoking cessation interventions implemented during the pandemic. Where it is necessary to select a single message, Message 2 (that refers to the consequences for both the individual’s health and the functioning of the health system) appears to be the optimal option. Exposure to this message was associated with a 34% increase in the proportion of respondents intending on quitting immediately or within the next two weeks and 44% of respondents accessing additional information about their smoking-related COVID-19 risk.

Of note is that the message with the strongest fear appeal (as assessed by ratings of alarm and worry) had among the largest effects on quit intentions but the weakest effect on information seeking. By contrast, the comparison message focused on financial outcomes had the strongest effect on information seeking but among the weakest effects on quit intentions. The negligible effects of all four messages on respondents’ physical, mental, and financial concerns are reassuring given the potential adverse effects of using fear appeals.^{17,18}

The lack of differences between countries across all outcome measures is noteworthy given the contrasting COVID situations at the time of data collection. This suggests that the tested messages may be tapping into common concerns and motivations among smokers in these countries, and therefore, they may be useful across these geographical contexts.

The primary limitations of this study are the use of a nonrepresentative online panel, the inclusion of a limited number of text-based messages, and the inability to assess resultant cessation behaviors. Of interest in future research on this topic would be an investigation of outcomes across a broader range of message types (eg, featuring more systematic variation across a larger number of message characteristics and the inclusion of images) with follow-up over time to assess cessation outcomes. In addition, the study focused on smokers in high-income nations; work is needed in low- and middle-income countries where smoking rates are often high and COVID-19 has affected very large numbers of people. Previous research suggests that similar messages are likely to be effective across a wide range of countries, including low- and middle-income countries,¹⁹ but this has yet to be tested in the context of COVID-19.

In conclusion, the COVID-19 pandemic represents an opportunity to encourage smokers to quit to reduce both their COVID-related risks and their risks of a broad range of noncommunicable diseases. The results of this study indicate that messages referencing COVID-related health risks are likely to constitute acceptable and

Table 2. Attitudinal and Behavioral Outcomes by Message Type (n = 1509)

Message perceptions ^a	Message 1 (n = 378)			Message 2 (n = 378)			Message 3 (n = 376)			Message 4 (n = 377)			p-value across messages
	Mean	SD	IQI										
Acceptable	4.0	1.0	3-5	3.9	1.1	3-5	4.1	0.9	4-5	3.9	1.0	3-5	0.041
Believable	4.1	1.0	4-5	3.9	1.1	3-5	4.1	0.9	4-5	3.9	1.0	3-5	0.020
Personally relevant	4.0	1.1	4-5	3.8	1.2	3-5	3.9	1.1	3-5	3.6	1.3	3-5	<0.001 ^e
Effective	3.5	1.2	3-5	3.3	1.2	3-4	3.5	1.1	3-4	3.3	1.2	3-4	0.019
Fear-inducing ^b													
Alarmed	2.3	1.0	1-3	2.1	1.0	1-3	1.7	0.9	1-2	1.8	0.9	1-3	<0.001 ^f
Worried	2.5	1.0	2-4	2.3	1.0	1-3	1.9	0.9	1-3	1.9	0.9	1-3	<0.001 ^f
Attitudinal outcomes ^a													
	Mean Δ	SD	Mean pre- and post-scores	Mean Δ	SD	Mean pre- and post-scores	Mean Δ	SD	Mean pre- and post-scores	Mean Δ	SD	Mean pre- and post-scores	
Change in concern about physical health	0.09 ^d	0.6	3.5, 3.6	0.04	0.5	3.4, 3.4	0.0	0.6	3.4, 3.4	-0.002	0.5	3.3, 3.3	0.032
Change in concern about mental health	0.07	0.6	3.0, 3.1	0.02	0.6	3.0, 3.0	0.01	0.5	2.9, 2.9	0.06	0.5	2.9, 2.9	0.341
Change in concern about financial security	0.01	0.6	3.4, 3.4	-0.04	0.5	3.6, 3.6	0.0	0.5	3.5, 3.5	-0.01	0.6	3.5, 3.5	0.819
Change in quit intentions ^c	0.2 ^d	0.7	2.9, 3.2	0.3 ^d	0.9	2.8, 3.1	0.1 ^d	0.6	2.7, 2.9	0.1 ^d	0.6	2.7, 2.8	<0.001 ^e
Behavioral outcome	n	%	n	%	n	%	n	%	n	%	n	%	
Accessed additional information (yes)	138	36.5	—	166	43.9	—	173	46.0	—	189	50.1	—	0.002 ^h

^aAssessed on 5-point scales: "Not at all acceptable/believable/relevant/effective/concerned" to "Very acceptable/believable/relevant/effective/concerned."

^bAssessed on a 4-point response scale: Not at all, A little, A moderate amount, A lot.

^cAssessed on a 5-point scale reverse scored as "Not thinking about giving up smoking" to "Trying to quit smoking at the moment."

^dSignificant difference between pre- and post-exposure mean scores.

^ePairwise comparisons showed significant differences between Messages 1 and 4 ($p < 0.001$) and Messages 3 and 4 ($p = .002$).

^fPairwise comparisons showed significant differences between Messages 1 and 3, Messages 1 and 4, Messages 2 and 3, and Messages 2 and 4 (all $p < .001$).

^gPairwise comparisons showed significant differences between Messages 1 and 3, Messages 1 and 4, Messages 2 and 3, and Messages 2 and 4 (all $p < .001$).

^hPairwise comparisons showed a significant difference between Messages 1 and 4 ($p < .001$), SD = standard deviation. IQI = interquartile interval. No differences observed in outcomes between countries.

potentially effective means of promoting cessation in Australia, New Zealand, and the United Kingdom during the pandemic.

Supplementary Material

A Contributorship Form detailing each author's specific involvement with this content, as well as any supplementary data, are available online at <https://academic.oup.com/ntr>.

Funding

This study was funded by a National Health and Medical Research Council Program Grant (GNT1149987). MJ is supported by a Scientia Fellowship from the University of New South Wales, Sydney, Australia.

Declaration of Interests

None declared.

References

- Berlin I, Thomas D, Le Faou AL, Cornuz J. COVID-19 and smoking. *Nicotine Tob Res.* 2020;22(9):1650–1652.
- Eisenberg SL, Eisenberg MJ. Smoking cessation during the COVID-19 epidemic. *Nicotine Tob Res.* 2020;22(9):1664–1665.
- Patanavanich R, Glantz SA. Smoking is associated with COVID-19 progression: a meta-analysis. *Nicotine Tob Res.* 2020;22(9):1653–1656.
- Public Health England. *Smokers at Greater Risk of Severe Respiratory Disease From COVID-19.* <https://www.gov.uk/government/news/smokers-at-greater-risk-of-severe-respiratory-disease-from-covid-19> (accessed August 2, 2020).
- Australian Medical Association. *Tobacco Use and COVID-19.* <https://infogram.com/ama-covid-19-factsheet-tobacco-1hd12y0rovwm6km?live> (accessed August 2, 2020).
- New Zealand Ministry of Health. *COVID-19: Advice for Higher Risk People.* <https://www.health.govt.nz/our-work/diseases-and-conditions/covid-19-novel-coronavirus/covid-19-information-specific-audiences/covid-19-advice-higher-risk-people> (accessed August 2, 2020).
- Tetik BK, Tekinemre IG, Taş S. The effect of the COVID-19 pandemic on smoking cessation success. *J Commun Health.* 2020. doi:10.1007/s10900-020-00880-2
- Hefler M, Gartner CE. The tobacco industry in the time of COVID-19: time to shut it down? *Tob Control.* 2020;29(3):245–246.
- Durkin S, Bayly M, Brennan E, Biener L, Wakefield M. Fear, Sadness and hope: which emotions maximize impact of anti-tobacco mass media advertisements among lower and higher SES groups? *J Health Commun.* 2018;23(5):445–461.
- Durkin S, Brennan E, Wakefield M. Mass media campaigns to promote smoking cessation among adults: an integrative review. *Tob Control.* 2012;21(2):127–138.
- Lambert SD, Loissele CG. Health information – seeking behavior. *Qual Health Res.* 2007;17(8):1006–19.
- Australian Institute of health and Welfare. *National Drug Strategy Household Survey 2019.* Canberra, Canada: AIHW; 2020.
- Stats NZ. *Smoking Is a Dying Habit.* 2019. <https://www.stats.govt.nz/news/smoking-is-a-dying-habit> (accessed August 8, 2020).
- National Health Service. *Statistics on Smoking, England – 2019.* England: NHSe Health and Social Care Information Centre; 2019.
- Amonini C, Pettigrew S, Clayforth C. The potential of shame as a message appeal in antismoking television advertisements. *Tob Control.* 2015;24(5):436–441.
- DiClemente CC, Prochaska JO, Fairhurst SK, Velicer WF, Velasquez MM, Rossi JS. The process of smoking cessation: an analysis of precontemplation, contemplation, and preparation stages of change. *J Consult Clin Psychol.* 1991;59(2):295–304.
- Blondé J, Girandola F. When defensive reactions contribute to the acceptance of fear-arousing communications. *Curr Psychol.* 2019;38:75–83.
- Hastings G, MacFadyen L. Controversies in tobacco control: the limitations of fear messages. *Tob Control.* 2002;11(1):73–75.
- Hammond D, Reid JL, Driezen P, et al. Are the same health warnings effective across different countries? An experimental study in seven countries. *Nicotine Tob Res.* 2019;21(7):887–895.