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STUDY PROTOCOL

ADDICTION SSA

Tailored text-messaging versus standard Quitline telephone counselling for smoking cessation among people who smoke from a low-socio-economic status background in Australia: A study protocol for a non-inferiority randomized controlled trial (The Quit By Phone Study)

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Abstract

Background and aims: Signficant inequalities in tobacco smoking exist, with higher smoking rates among people from low-socio-economic status (low-SES) populations. Tailored technology-based programs for low-SES smoking populations have the potential for high reach, but require effectiveness data from large-scale trials. This trial among Australians who smoke from a low-SES background will determine the effectiveness and cost-effectiveness of tailored text-message (TTM) support compared with standard Quitline (SQL) telephone support service.

Design, setting and participants: This is a two-arm, parallel group, randomized, non-inferiority trial with allocation concealment and blinded outcome assessment in an Australian population within the greater Sydney region in New South Wales. Participants are adults who smoke daily (n = 1246), are interested in quitting and currently receiving a government pension or allowance, and will be recruited via advertisements.

Intervention and comparator: Participants will be randomized (1:1 ratio) to receive either 12 months of TTM quit support or enrolment in SQL telephone support.

Measurements: Assessments will be completed at baseline (telephone interview), within 1 month (check-in call), at 3 months (on-line questionnaire) and 12 months (telephone interview) post-randomization. The primary outcome will be 6-month continuous abstinence verified by carbon monoxide breath test at 12-month follow-up. The study will test whether TTM is non-inferior to SQL by a non-inferiority margin of 2%, i.e. the quit rate in the TTM group will be no worse than 2% less than the quit rate in the SQL group. Secondary outcomes will include self-reported continuous and point prevalence abstinence and acceptability and cost-effectiveness of TTM versus SQL.

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Conclusion: Should the tailored text-message support prove non-inferior and more cost-effective than Quitline for this population, this will provide an opportunity for the upscaling of an effective, inexpensive and tailored quit support service. The trial findings will inform cessation treatment policy for priority populations in Australia and globally.

KEYWORDS
Effectiveness, randomized controlled trial, smoking cessation, social disadvantage, text-messaging, tobacco

INTRODUCTION

Recent data show that approximately 8.3% of Australians (aged 14 years or older) smoke daily, corresponding to approximately 1.8 million Australians [1]. People from low socio-economic areas are significantly more likely to smoke daily compared to those from high socio-economic areas [1], highlighting this priority group for smoking cessation efforts.

Telephone cessation support (such as Quitline) has long been seen as the backbone of cessation services in many countries [2]. However, they are often under-utilized [3–8] and the absolute quit rates among Quitline recipients remain low overall [9], and often even lower among people from low-socio-economic status (low-SES) backgrounds [10, 11]. Barriers for lack of engagement and premature discontinuation of Quitline services include guilt, shame and stigma [12]. In instances where shame prevented people who smoke from seeking treatment, responders expressed greater receptivity to alternate support (e.g. text-messaging) [12].

While telephone support services are cheaper than face-to-face treatments, they still have significant costs associated with utilization, as they require housing, set-up/development, management, oversight and training [13]. Alternatively, text-message programs are typically affordable and easily implemented. There is evidence that supports the effectiveness of text-message-based programs for increasing smoking cessation [14, 15]; however, few trials have compared a text-message program to another form of standard care smoking cessation provision [14, 16]. To our knowledge, no studies have made the comparison against the standard model of care, Quitline, in most developed countries and some low- and middle-income countries. Furthermore, researchers have highlighted the need for mobile phone-based interventions to be tested on a larger scale and to target disadvantaged groups [17].

The primary objective of this trial, among Australians who smoke and are from a low-SES background, is to evaluate the effectiveness and cost-effectiveness of a tailored text-message (TTM) program at achieving 6-month continuous verified smoking abstinence at 12-month follow-up, compared to standard Quitline care (SQL). It is hypothesized that TTM will be at least as effective (i.e. no more than 2% lower than the SQL group) and more cost-effective than SQL.

METHODS

Design

This is a parallel, two-group, non-inferiority, randomized controlled trial.

Setting

The trial will be conducted within the greater Sydney region in New South Wales (NSW), Australia. Screening and consenting will occur predominantly via an on-line questionnaire with provision for over-the-telephone and mailed hard copy consent form completion. A baseline interview, check-in call within the first month of study enrolment and follow-up interview at 12-months post-baseline completion will occur via telephone. A treatment adherence questionnaire will be completed 3 months post-baseline by participants on-line (or over the telephone for participants unable to complete on-line) (see Figure 1). All procedures will be completed via a remote call environment by Trial Coordinating Centre (TCC) staff from the National Drug and Alcohol Research Centre (NDARC), University of New South Wales, Sydney, Australia. TCC staff can complete these calls on site or remotely owing to hybrid working structure.

Participants

The participants comprise a total of 1246 people who currently receive a government pension or allowance (a proxy of low-SES) who smoke daily from Sydney, NSW, and the wider catchment area (within 150 km of the TCC).

Inclusion criteria

Participants will be included if they are aged at least 18 years; in receipt of a government pension or allowance; currently smoking daily and wanting to quit; able to understand and speak in English; willing and interested to make a quit attempt in the next week; own a mobile phone that can receive and send text messages; agree to use allocated

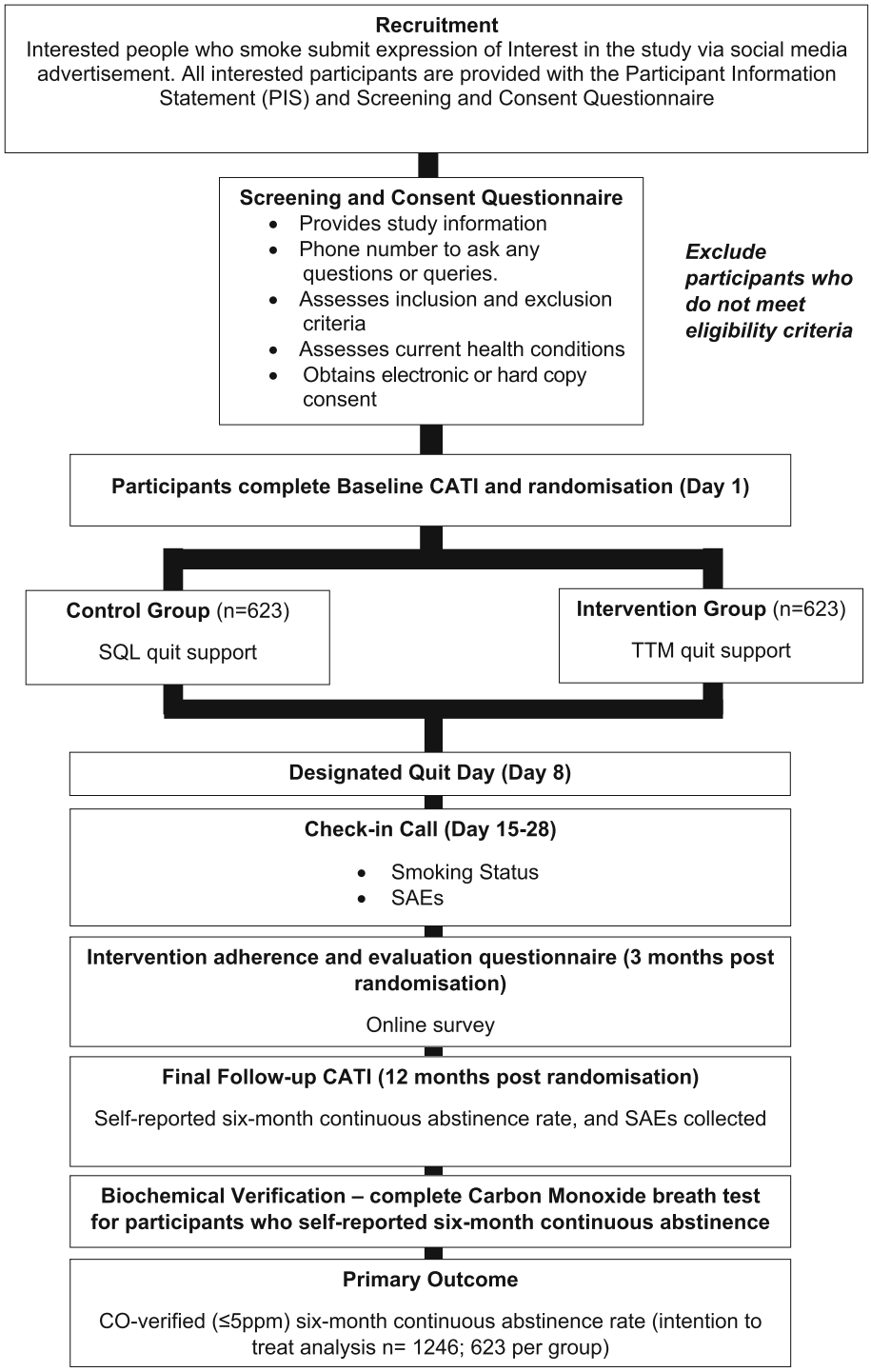

FIGURE 1 Flow-chart of study procedure. CATI = computer-assisted telephone interview; SAE = serious adverse event; SQL = standard Quitline; TTM = tailored text-messaging.

behavioural quit support service (TTM or SQL); able to provide informed consent; available for follow-up over a 12-month period; and willing to complete all study measures.

Recruitment

People who smoke from a low-SES background will be recruited from Sydney and the wider catchment area through on-line study advertisements predominately via Facebook.

People who are interested will be advised on the study webpage to read the Participant Information Statement (PIS) prior to completing the on-line contact form.

TCC staff will e-mail individuals who have submitted an expression of interest to participate in the study. This e-mail will include: (i) a copy of the PIS, (ii) the contact number for the Quit by Phone Study and (iii) a link to their electronic screening and consenting questionnaire that will also be sent via text message.

For participants who may not have electronic access to complete the form on-line they can complete the screening questions over the

telephone with a TCC staff member and be mailed a hard-copy consent form to sign, date and return (using a provided pre-paid return envelope).

Participants will also be asked to consent to releasing their Medicare Benefits Scheme and Pharmaceutical Benefits Scheme (prescription medications and government subsidized out-of-hospital health services) claims information for the cost-effectiveness analysis, although this consent is optional and not required for participation.

Randomization: allocation concealment and sequence generation

The data management system (REDCap) at the TCC will assign a unique randomization number to study participants using a computer pre-generated randomization list embedded in the system. An independent statistician will generate and upload the randomization list into REDCap. Following the baseline interview, the interviewer will randomly assign each participant to one of the treatment groups in a 1:1 ratio. The permuted block randomization will use unequal block sizes of 4 and 8.

Provision of the respective behavioural quit support service (TTM or SQL) will commence after completion of the baseline interview and randomization.

Blinding

The study will be single-blind. TCC staff conducting 12-month follow-up interviews will be blinded to participants' treatment allocation. Computer-assisted telephone interviews (CATIs) will be arranged so that interviewers who complete the 12-month follow up interview have not completed the same participant's baseline interview or check-in call, in order to be blinded when collecting abstinence data. Once progressing past the first section in the follow-up interview, interviewers will be unblinded when needed (i.e. treatment adherence). The primary outcome is biochemically verified abstinence, obviating interviewer bias.

Study treatments

After randomization, the TCC staff will inform each participant about their allocation and provide details on their allocated quit support and advise them of their designated quit day (i.e. day 8 post-randomization).

Tailored text message program

Each participant randomized to the TTM group will receive 12 months of text message quit support, which will commence the day after randomization. The text program includes quit day planning, tips for coping with nicotine withdrawal symptoms, information regarding quit smoking aids [e.g. nicotine replacement therapy (NRT)], goal-setting, study progress updates, relapse prevention and motivational 'feel-good' messages. The program incorporates a 'quit buddy' persona named Lou and text messages will include text, emojis and hyperlinks to web-based videos, quit support websites and graphics interchange format (GIF) images. The frequency of text-message support will taper throughout the program, starting at three messages a day for the first month, then two a day for the second month, one a day for months 3–6 and two messages a week for the last 6 months. Participants will receive a total of 318 text messages as standard, some of which are specifically tailored depending on participants' responses at the baseline interview. Initial text messages will be focused upon preparing participants for their designated quit day (day 8) and providing tips for quitting smoking. Over time, the focus of the messages will shift to preventing relapse with an emphasis on achieving milestones.

Certain text messages will be tailored specifically for individual participants. This will occur based on participants demographic and smoking information gathered during the baseline interview. The TTM program utilizes both 'personalization' and 'tailoring' of text messages. Personalization is defined as the insertion of specific individual information into a standard message. There are four personalization tokens: first name, time to first cigarette, number of cigarettes smoked per day and weekly cost of tobacco. Tailoring is defined as participants receiving completely different messages depending on their answers to specific questions, allowing the program to tap into the participant's specific needs. There are 11 tailoring tokens (denoted by '[a]' in Table 1) including: frequency of urge to smoke, support during quit attempt, quit approach, reasons for quitting, smoker identity, factors facilitating/motivating to quit smoking, triggers to smoking, barriers to quitting, social support, smoking-induced deprivation (financial stress) and the use of other smoking cessation aids. For example, a participant who reports social events as a trigger for smoking will receive messages with specific tips regarding how to deal with this, whereas a participant who reports drinking coffee as their main trigger will receive different tips and advice. Further examples of program tailoring are provided in the Supporting information, Table S1 (additional file 1) and a full list of the baseline assessments used for personalization and tailoring are provided in Appendix A of the Supporting information (Tables S2 and S3, additional file 1).

The program is automated, and once a participant is enrolled minimal engagement from research staff is required. Participants are advised that the program is automated, and while they can reply to messages to track their own progress and engage with the program, it is not a dynamic two-way text program. Replies to texts are monitored by research staff, and are only followed-up if they pertain to participant safety or trial-related matters. Participants will have the option to use a keyword function for additional on-demand text support if required. Participants will be free to opt out, pause and opt in again to receiving text messages at any stage and will still be able to continue study participation. Additional details on the features of the TTM program are provided in the Supporting information (additional file 1).

TTM program development

Text-message content was developed by an expert advisory group, and based on text messages currently rolled out by the successful STOMP mCessation program [18] for the New Zealand population. It also builds upon existing text messages adopted in a HREC-approved clinical trial (ACTRN12621000076875) [19], with further refinement to ensure that it meets the needs of Australians who smoke from low-SES backgrounds. The program includes a range of behaviour change techniques (BCTs) that were pragmatically feasible to be implemented via text message (63 of the 93 BCTs, clustered into 15 of the 16 BCT groups). The program was further refined through consultation with a 'consumer advisory group' (e.g. a user group comprised of current and ex-smokers of low-SES background) who advised on the program structure and text-message content, as well as providing user-insight on the receptivity of the text messages. This consultation occurred over two phases and ensured that the developed TTM program and all related text messages met the requirements and expectations of the target population. Text messages underwent a literacy demand review check to ensure that they met the maximum considered reading level of 8th grade, as measured by the Kincaid Grade Level Test. Additional details on the development of the TTM program are provided in the Supporting information and Figure S1 (additional file 1).

Quitline

Participants who are randomized to the SQL group will be referred by TCC staff to the NSW Quitline: a free and confidential telephone service designed to help people who smoke quit and maintain abstinence from tobacco smoking. Following their initial call with NSW Quitline, participants can join the 'call-back service' through which they can schedule six additional telephone support calls. These calls are tailored to the needs of the individual caller (e.g. thinking about quitting and in need of discussion with a NSW Adviser, or ready to quit and in need of a quit plan), and are delivered at a frequency (e.g. weekly, fortnightly, etc.) that is agreed upon based on the individual's needs. Additional details regarding the standard Quitline support service are provided in the Supporting information (additional file 1).

DATA COLLECTION AND MEASUREMENTS

Baseline

All participants will complete a baseline computer-assisted telephone interview (CATI) with trained research assistants enquiring about demographic, smoking status and smoking habits. The answers to this will inform the personalized and tailored texts that the participant will receive if randomized to the TTM group. The baseline telephone interview takes approximately 20–30 minutes and participants will be reimbursed $AU50 for completing the interview.

Check-in calls

All participants will receive a check-in call by trained research assistants between the 15th to 28th days from baseline interview. This call will enquire about smoking status and serious adverse events (SAEs).

Follow-up

Participants' adherence to the allocated behavioural quit support service, ratings of the intervention acceptability and helpfulness and the use of concomitant smoking cessation treatments will be assessed at 3 months post-baseline interview, via on-line questionnaire. This questionnaire will be accessed via a URL, which will be delivered by text message and email (or conducted over the telephone for participants unable to complete on-line). Participants will be reimbursed $AU25 for their time completing the questionnaire.

The TCC staff will complete the final follow-up assessment at 12 months post-baseline interview using a structured CATI program. The interview will collect data on participants' smoking status, financial stress, quality of life, use of other smoking cessation treatments and SAEs. The follow-up telephone interview takes approximately 15–30 minutes and participants will be reimbursed $AU50 for completing the interview.

Measurements

The measures and time-points at which these are collected are summarized in Table 1.

Primary outcome

The primary outcome measure will be biochemically verified 6-month continuous abstinence, assessed at the final 12-month follow-up interview. Continuous 6-month abstinence will be defined as having self-reported abstinence from tobacco smoking (smoked five or fewer cigarettes) for the 6 months before the final 12-month follow-up and passing a biochemical verification via a carbon monoxide (CO) breath test (returning a CO score of ≤ 5 p.p.m.), with missing data treated as smoking [28]. Participants will be asked to either (i) perform the test themselves using a hand-held remote iCO™ Smokerlyzer® device mailed to them together with accompanying instructions while on a video call with TCC staff or (ii) have a trained research assistant attend their homes or another place specified by the participant to conduct the test. Participants will be reimbursed $AU50 for completing the CO test.

Secondary outcomes

Effectiveness outcomes will be (1) self-reported abstinence including 7-day point prevalence (not smoking even a puff in the past 7 days)

TABLE 1 Schedule of enrolment and follow-up assessments across study period.

Study period					
Data collection	**Screening**	**Baseline**	**Check-in call (days 15– 28)**	**Adherence questionnaire (month 3)**	**Final follow-up (12 months post-randomization)**
Enrolment					
Eligibility screen	X				
Informed consent (on-line or hard copy)	X				
Treatment allocation		X			
Quit date[a] (day −8 post randomization)		X			
Assessments					
Demographic information: name,[a] age, sex, postcode and receipt of government pension	X				
Socio-demographic information: ancestry, education, marital status and family composition		X			
Socio-economic demographics: employment status and household income		X			X
Access to health-care services [20]		X			
Study treatment adherence				X	X
SAEs			X		X
Self-reported abstinence			X	X	X
Smoking information: daily consumption,[a] weekly costs,[a] withdrawal symptoms, urges[a] [21]		X	X	X	X
Smoking (and quitting) history [22], self-efficacy [23], attitude [24], identity [24, 25]		X			X
Financial stress [26]		X			X
Quality of life (EQ-5D-5L) [27], general health status [27]		X			X
Acceptability of quit support					X
Use of other smoking cessation aids		X		X	X
CO-verified 6-month abstinence					X

[a]Denotes a tailoring token; TTM = tailored text-messaging; SAE = serious adverse event; CO = carbon monoxide.

assessed at check-in call, 3-month on-line survey and final follow-up, and continuous abstinence assessed at final follow-up (smoked five or fewer cigarettes in last 6 months); and (2) the reduction in number of cigarettes smoked from baseline to follow-up, measured via cigarette consumption among people continuing to smoke (number of cigarettes smoked per day; mean reduction and proportion of participants who achieved ≥ 50% reduction at follow-up compared to baseline cigarette consumption).

Adherence outcomes include the acceptance and maintenance rate of each intervention, measured via the data collected in study treatment adherence assessments.

Health economic outcomes comprise (1) quality of life as measured by the EQ-5D-5L at baseline and 12-month follow-up and (2) linked data on subsidized medicine use and out-of-hospital subsidized health-care use, including costs to government.

Safety monitoring

No medicinal products or medical devices are provided in this trial, as it is assessing the effectiveness of behavioural quit support programs for tobacco smoking cessation. There is minimal possibility of harm to participants (i.e. adverse events). In fact, the Txt2Stop randomized controlled trial (RCT) (2011) 'identified no evidence of any adverse effects of the [telephone-based] txt2stop intervention on thumb pain while texting, or on road traffic accidents' [29].

Only the occurrence of SAEs will be monitored and recorded in this trial. All participants will complete a check-in call (within approximately the first 2–4 weeks of the trial), a final follow-up interview (12 months after randomization) and will be provided with the Quit by Phone Study toll-free telephone number through which they will be able to self-report any SAE and seek advice from the research team.

Sample size

The average biochemically verified quit rates at 6 months in a Cochrane Review, which included text-message-based interventions, were 9.5% in the intervention group and 5% in the control group [30]. A previous RCT found that a 6-month verified abstinence rate among people who smoke from a low-SES background provided with

8 weeks' free combination NRT and Quitline support was 5% [31]. Factoring in a 20% relapse rate between 6- and 12-month follow-up [32] and considering an expected lower quit rate among people who smoke from a low-SES background who will not be offered free pharmacological treatment, a conservative 4% quit rate in the control (SQL) group and 6% quit rate in the TTM intervention group at 12-month follow-up has been assumed.

Therefore, using a one-sided significance level of 2.5%, a sample size of 1246 participants (623 participants per group) will confer 90% power to test whether TTM is non-inferior to SQL by a non-inferiority margin of 2% (i.e. the quit rate in the TTM group will be no worse than 2% less than the quit rate in the control (SQL) group).

Justification for non-inferiority (NI) margin

A NI margin of 2% was selected with consideration of key recommendations from the US Food and Drug Administration and the European Medicine's Agency, as well as clinical judgement [33, 34]. Three factors were fundamental in influencing the establishment of a tight NI margin: (i) effectiveness, (ii) cost of the TTM program and (iii) target population requirements. In considering the level of justifiable compromise between intervention effectiveness and the supplementary benefits of the TTM program, the inclusion of such factors is essential to guide policy decision-making.

Data management

Data will be captured and stored in a specifically designed REDCap database. Data will be password-protected with group code concealed and blinded to analysts, using the appropriate data management software, REDCap. The data will be encrypted in transit and storage.

Data analysis

Baseline characteristics

Baseline characteristics of both study groups will be presented using frequency and percentages for categorical variables and mean and standard deviations or median ± interquartile range for continuous measures.

Primary analysis

The primary analysis will compare the quit rates between study groups (p_{TTM} and p_{SQ}) in a Bayesian framework. Beta-binomial posterior distributions will be generated for each group, using an uninformative beta prior and the observed data for the binomial likelihood. One million random draws from each posterior distribution will be taken, and non-inferiority will be established if 97.5% of these draws support the non-inferiority hypothesis [i.e. $Pr(p_{TTM} - p_{SQ} > -2\%) \geq 0.975$]. This is equivalent to the lower bound of the 95% credible interval for the difference in quit rates ($p_{TTM} - p_{SQ}$) remaining above the non-inferiority margin (of -2%). The primary analysis will be based on the intention-to-treat principle, where individuals with missing self-reported or biochemically verified abstinence data will be assumed 'treatment failures' [i.e. primary analysis assumption is missing not at random (MNAR)]. Sensitivity analyses will involve: (i) using multiple imputation to account for missing data, including an imputation favouring inferiority of TTM [missing at random (MAR) assumed]; and (ii) using informative beta conjugate priors based on previous literature (MNAR assumed). A further sensitivity analysis will be dependent upon the result of Little's missing completely at random (MCAR) test. This will exclude participants with missing data, use of other smoking cessation medication and/or methods and participants with protocol deviations (MCAR assumed) [35].

The superiority of TTM will be established if the primary Bayesian analysis outlined previously satisfies $Pr(p_{TTM} - p_{SQ} > 0) \geq 0.975$, equivalent to the lower bound of the 95% credible interval for the difference in quit rates being greater than 0%.

Secondary analysis

Secondary analysis will involve comparing secondary outcome measures between study groups using multiple logistic regression. For the secondary cessation outcomes measured at each follow-up, generalized linear mixed models will be used, including time as a fixed effect as well as random effects to adjust for the correlation of observations among individuals over time. All secondary and safety analyses will be conducted under a superiority testing framework and are only to be considered as exploratory analyses. As such, two-sided 95% confidence intervals and *P*-values will be used to summarize treatment group comparisons, with no adjustment to the type I error rate for multiple comparisons.

The consistency of effects for the primary outcome will be assessed in the following subgroups: age (19–34 years, > 34 years), sex (male, female) and nicotine addiction (Fagerström score for nicotine dependence ≤ 5, > 5) [36].

Health economic analysis

The cost-effectiveness analysis will be performed from the Australian health-care system perspective. First, a within-trial analysis will be undertaken using the estimated abstinence differences at 12-month follow-up to derive the additional cost per successfully quit participant (6-month biochemically verified abstinence) for the TTM program versus SQL quit support. In addition, a within-trial cost-utility analysis will be undertaken to examine the cost per quality-adjusted life year (QALY) saved between the two study groups. Intervention implementation costs will be captured by the staff recording time taken for assessment, administration, text-message costs and Quitline use costs. Potential cost savings concerning other health-care

utilizations (PBS and MBS) will be captured within the period from randomization to the 12-month follow-up and we will estimate the costs differences controlling for baseline levels of health-care costs (1-year pre-randomization). Participants' MBS and PBS records of health-care use pre- and post-intervention will be linked to their trial data. Mortality during the follow-up period will be recorded with the date of death noted. QALYs accrued during the follow-up period will be estimated based on the EQ-5D responses at baseline and 12 months, assuming linear interpolation between these reported measurements and using Australian reference values [27]. While we expect the majority of participants will be alive at the final follow-up, if a participant dies during the follow-up period their QALY score at this point of time and forever in the future will be 0 with linear interpolation from the baseline QALY score.

Given that many of the benefits from reduction in health-care utilization and reduction in morbidity and mortality are likely to present themselves post 12-month follow-up, it is important to estimate the long-term implications of changes in smoking cessation using a lifetime model. At the end of the 12-month follow-up, future QALYs will be modelled using a simulation model based on their smoking status at the 12-month follow-up. To model the long-term potential cost savings and health benefits from tobacco smoking cessation, a Markov model similar to Flack *et al.* (2007) [37] but populated using the most recent Australian data on smoking transition probabilities (e.g. the likelihood that former smokers re-start), disease, mortality and costs will be used. This economic evaluation modelling approach matches that used for a previous UK mobile phone-based smoking cessation intervention evaluation [38]. A probabilistic sensitivity analysis will be undertaken to explore the robustness of the results to the uncertainty around the parameters in each analysis.

Ethics

Ethical approval has been obtained from the University of New South Wales Human Research Ethics Committee (HC210410).

Current status

Trial recruitment commenced in November 2022 and finished in September 2023. The target sample size was met. Final data collection is expected to be completed in November 2024.

DISCUSSION

The key adaptive strengths of text-message programs are high user acceptability, the capacity for tailoring the intervention, affordability and scalability.

Text-messaging has high appeal for people who smoke from a low-SES background, as this group can be reluctant to engage with face-to-face or telephone support, and text-messaging offers increased convenience, privacy, confidentiality and reduced stigma [12]. People who smoke have expressed high receptivity to text-message-based behavioural quit support [12, 39].

Text programs can deliver general behavioural support or can be programmed to include simple personalized messages for individuals, or even more complex tailored advice depending on an individual's quit journey. Technological capabilities of text programs are ever-increasing and allowing for more sophisticated coding of program logic and, ultimately, a more personalized and tailored program.

Text programs have low set-up costs and minimal ongoing running costs, and therefore present a substantially cheaper option than other behavioural cessation modalities (e.g. Quitline services or face-to-face interventions) that require set-up, housing, staffing and operation costs. Research has shown their cost-effectiveness as a smoking cessation intervention among the general smoking population [38, 40], and it is probable that text-message programs have the potential to especially benefit low-income countries where smoking cessation services are cost prohibitive.

More than 95% of the world's population use mobile phones [41], meaning that text programs can be delivered to billions of people world-wide. Furthermore, the automation capacity of texting can make implementing these programs easier. For example, automated responses can be set up for when people reply to the program.

This study has a few key strengths, including its large sample size within a priority population, and its pragmatic nature with the inclusion of a usual care (standard Quitline) comparator arm. Additionally, the tailored text program utilized in this study has a high degree of tailoring with several quit-related topics (such as use of quit smoking aids, reasons for quitting and smoking triggers) to make the program more relatable, engaging and helpful to each individual participant. However, a limitation of the program is its inability to change or adapt throughout the 12-month period. The tailoring is programmed from responses to these topics at baseline, and the tailoring is set for the full 12-month period. It is important that text support can respond to changes in a participant's quit journey (such as smoking relapse or trying a different quit aid), and further research and development should target this aspect of text programming.

If the tailored text-message program is effective, it could be upscaled and rolled out through existing services such as Quitlines, or for even broader coverage globally it could be implemented through non-governmental organizations (NGOs) and the World Health Organization (WHO). Additionally, widespread programs can still have a degree of tailoring by incorporating a short set of questions (delivered by text or on-line survey), using the answers to tailor the program to the individual. The program could be further enhanced by incorporating this tailoring at multiple time-points throughout the program duration to ensure that adaptive and responsive quit support is provided. Finally, the use of AI and chatbots could play a key role in providing instant support and increasing the adaptiveness, responsiveness and tailoring of this text support to individuals. The feasibility of using these technologies within text-message quit support should be investigated.

Overall, trial findings will inform cessation treatment policy, not just within Australia but on a wider international scale. A text-message program tailored to low-SES groups, that is equally effective or

superior to telephone support, could enable a sizeable, inexpensive and scalable option for behavioural quit support that would complement existing smoking cessation services.

AUTHOR CONTRIBUTIONS

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DECLARATION OF INTERESTS

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DATA AVAILABILITY STATEMENT

Trial data are available on request to the Principal Investigator of the study.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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