



NOVA

University of Newcastle Research Online

nova.newcastle.edu.au

Tzelepis, Flora; Paul, Christine L.; Walsh, Raoul A.; Wiggers, John; Knight, Jenny; Lecathelinais, Christophe; Daly, Justine; Neil, Amanda; Girgis, Afaf "Telephone recruitment into a randomized controlled trial of quitline support". Originally published in American Journal of Preventive Medicine Vol. 37, Issue 4, p. 324-329 (2009)

Available from: <http://dx.doi.org/10.1016/j.amepre.2009.05.022>

© 2009. This manuscript version is made available under the CC-BY-NC-ND 4.0 license
<http://creativecommons.org/licenses/by-nc-nd/4.0/>

Accessed from: <http://hdl.handle.net/1959.13/808309>

Telephone recruitment into a randomized controlled trial of quitline support

Flora Tzelepis¹, BSc(Psych)(Hons), Christine L Paul¹, PhD, Raoul A Walsh¹, PhD, John Wiggers², PhD, Jenny Knight², MMedSci(HP), Christophe Lecathelinais¹, DESS de Mathematiques Appliquees, Justine Daly², MMedSci(HP), Amanda Neil³, PhD, Afaf Girgis¹, PhD

¹Centre for Health Research & Psycho-oncology, The Cancer Council NSW, University of Newcastle & Hunter Medical Research Institute, Newcastle, New South Wales, Australia

²Hunter New England Population Health, Hunter New England Area Health Service, Newcastle, New South Wales, Australia

³Health Economist, Queensland, Australia

Correspondence and reprint requests to:

Flora Tzelepis
Centre for Health Research & Psycho-oncology (CHeRP)
Cancer Council NSW & University of Newcastle
Room 230A, Level 2, David Maddison Building
Callaghan NSW 2308 Australia
Phone: +61 2 4913 8606 Fax: +61 2 4913 8601
E-mail: Flora.Tzelepis@newcastle.edu.au

Published in: American Journal of Preventive Medicine 2009;37(4):324-329.

Abstract

Background: A minority of smokers use effective cessation aids. Increasing the rate of assisted quit attempts is a tobacco control priority. This study determined the: i) proportion of adult daily smokers actively recruited by telephone to cessation support; ii) cost-per-smoker recruited; and (ii) compared the characteristics of participants to smokers in the New South Wales (N.S.W., Australia) general population.

Methods: Between September 2005 and April 2007, 1,562 adult daily smokers randomly selected from the electronic N.S.W. telephone directory were recruited into a randomized controlled trial. The proportion of smokers and cost-per-smoker recruited were examined. Participants were compared to N.S.W. adult daily smokers from the N.S.W. Population Health Survey and CHERP Smoking Community Survey. Analysis was completed in 2008.

Results: Over half (52%) of eligible smokers contacted by telephone were recruited into cessation support. The cost-per-smoker recruited was AU\$71 (US\$59). Active telephone recruitment successfully enrolled smokers that are currently under-represented among quitline users. For instance, more than two-thirds (68%) of participants were not intending to quit within a month. Compared to N.S.W. adult daily smokers participants were significantly more likely to be older, higher educated, married/living with partner or divorced/separated, a non-metropolitan resident, more nicotine dependent, more ready to quit and have fewer household members. Participants were significantly less likely to live with a smoker than N.S.W. adult daily smokers.

Conclusions: Active telephone recruitment has potential to substantially increase the proportion of smokers using quitline services at a reasonable cost. This method also engages smokers currently under-represented in quitline populations.

Introduction

Quitlines provide effective smoking cessation support.¹⁻⁴ *Passive recruitment channels* requiring smoker-initiated contact with quitlines⁵ are commonly utilised (e.g., mass media⁶⁻⁹). However, quitlines have also adopted *active recruitment channels* that involve recruiter-initiated contact with smokers⁵ (e.g., fax referrals¹⁰⁻¹³). Only 1-7% of adult smokers call quitlines each year.^{7, 9, 14-17} A much higher proportion must be reached for quitlines to substantially impact smoking prevalence. A target of 16% of smokers receiving quitline services annually has been proposed.¹⁸

Active telephone recruitment could potentially increase quitline utilization given it recruits the largest proportion of smokers,⁵ is acceptable¹⁹ and re-enrolls more former quitline users.²⁰ For example, 41% of cold-called smokers received quitline services.²¹ The few trials that actively telephoned smokers to offer proactive telephone counseling (i.e., counselor-initiated support)²²⁻²⁴ found 38%²² and 67%²⁴ of smokers were receptive. However, smokers interested in quitting,²² with young children²⁴ or health maintenance enrollees²³ were targeted. No trial engaged smokers from the entire general population or calculated the cost-per-smoker recruited.²²⁻²⁴

Compared to the general smoking population, quitline callers are more likely to be female,^{14, 16, 25, 26} younger,^{14, 25, 26} unemployed,^{14, 26} never married,²⁶ higher educated,^{25, 26} more addicted,^{14, 16, 25, 26} previously quit²⁶ and ready to quit within 30 days.²⁵ Active telephone recruitment may increase the reach of quitlines by enrolling currently under-represented smokers.^{27, 28} Past trials offering proactive telephone counseling to smokers actively recruited by telephone have not assessed their sample's representativeness compared to the general smoking population.²²⁻²⁴

This study aims to:

- (i) assess the proportion of adult daily smokers from the entire general population enrolled into a proactive telephone counseling trial via active telephone recruitment;
- (ii) calculate the cost-per-smoker recruited; and
- (iii) determine the representativeness of participants compared to New South Wales (N.S.W.) smokers.

Methods

Sample

Recruitment occurred between September 2005 and April 2007. Eligibility criteria were: (i) use tobacco daily; (ii) 18 years or older; (iii) N.S.W. resident, Australia; and (iv) English-speaking. Non-daily smokers were excluded given fewer in this group wish to quit and receive cessation assistance.²⁹

Procedures

Telephone numbers were randomly selected from the N.S.W. Electronic White Pages telephone directory. Households were mailed an information letter and telephoned within two weeks. At least six attempts were made to contact households and another five to speak to the smoker. If two or more eligible smokers were residents, a computerized age grid randomly selected one smoker. This smoker regardless of quitting intention was invited to join a randomized controlled trial offering free proactive telephone support or written materials from the N.S.W. Quitline and baseline, 4-, 7- and 13-month assessments. If the smoker gave verbal consent a computer-assisted telephone interview (baseline) was administered after which a random number generator allocated the smoker to proactive telephone counseling or one-off mailed written materials. Six

proactive telephone counseling calls were offered to smokers willing to quit within a month and four to those not ready. Recruitment and baseline measurement took 15 minutes on average.

Ethics approval was granted.

Measures

Socio-demographics: age, gender, country of birth, Aboriginal or Torres Strait Islander origin, education, marital status, employment, private health insurance, area of residence, household members and other household smokers.

Smoking-related items: time to first cigarette after waking, number of cigarettes smoked per day,³⁰ quitting intentions,³¹ quit attempt in past 12 months,³¹ longest abstinence in past 12 months and quitting strategies on most recent quit attempt.

Comparison with N.S.W. smokers

Participants were compared on common items to adult daily smokers from the 2006 N.S.W. Population Health Survey³² and 2006 CHeRP Smoking Community Survey,³³ given the former, although larger, contained limited smoking cessation data.

Analysis

Analysis was completed in 2008 using SAS software. Categorical data were described using proportions and continuous data by means, standard deviations and medians. The chi-square test and independent samples t-tests assessed whether participants differed from N.S.W. smokers.

Given the large samples, tests of significance were performed at $\alpha=0.01$.

Results

Of 48,014 households selected, 4,304 were unreachable. Of 43,710 reached, 40,702 were ineligible. From 3,008 eligible households, 939 (31.2%) smokers refused, 502 (16.7%) household members refused and 5 (0.2%) interviews were not completed. If smoking status was not identified before the call ended the household was assumed to contain an eligible smoker. Consequently, the recruitment rate may be under-estimated.

Recruitment rate

From 3,008 eligible households, 51.9% (n=1,562) of smokers contacted actively by telephone agreed to receive cessation support. Assuming that 14.2%³² of 4,304 unreachable households contained an eligible smoker, 43.2% (1,562/3,619) of smokers agreed to receive cessation assistance.

Ninety percent of smokers offered proactive telephone counseling received at least one support call. Among recipients, the mean was 4.4 calls (SD=2.9; median=4).

Cost-per-smoker recruited

Total recruitment cost (AU\$110,951.72) was calculated from a service provider's perspective (i.e., excluding research costs). This consisted of: preparing and mailing letters; phone call(s) for recruitment; programming and item completion required to provide cessation support. The cost-per-smoker recruited was \$AU71.03 (US\$59.03).

Comparison to N.S.W. smokers

Tables 1 and 2 outline participant characteristics compared to adult daily smokers from the N.S.W. Population Health Survey³² and CHeRP Smoking Community Survey³³ respectively.

Compared to N.S.W. adult daily smokers,^{32, 33} participants were significantly more likely to be older, university/tertiary qualified, have fewer household members, married/living with partner or divorced/separated, a non-metropolitan resident, smoke their first cigarette after waking sooner, consume more cigarettes per day, have a shorter longest abstinence in the past 12 months and intend to quit within 30 days or 6 months. Participants were significantly less likely to live with a smoker than N.S.W. adult daily smokers.³³

[Tables 1 and 2 about here]

Discussion

Approximately half (52%) of eligible smokers were recruited actively by telephone to cessation support. This is higher than a U.S. trial (38%),²² however lower than a Hong Kong trial (67%).²⁴ The Hong Kong trial subjects were parents of young children who had already participated in research,²⁴ and thus may have been more motivated to participate than smokers in the general population. The trial recruitment rate (52%) was substantially higher than the 1-7% of adult smokers using quitlines each year^{7, 9, 14-17} and the target to reach 16% annually.¹⁸ The findings illustrate that active telephone recruitment has great potential for linking smokers to quitlines.

The cost-per-smoker recruited of \$AU71 (US\$59) compares favourably to the cost of various television and radio advertisements in generating quitline calls.³⁴ These ranged from US\$70-\$1,629 per call for television and US\$332-\$1,053 per call for radio.³⁴

Approximately two-thirds (68%) of participants at baseline were not intending to quit within 30 days. In studies of quitline callers, more than 90% of U.S. smokers planned to quit within a month²⁵ and 9% of U.K. smokers reported no immediate quitting plans.³⁵ Therefore, active telephone contact is useful for recruiting new groups of quitline users.

Study limitations included that the N.S.W. electronic telephone directory excluded unlisted telephone numbers. Tobacco control activities in N.S.W. during recruitment included anti-smoking mass media campaigns,³⁶ introduction of graphic pictorial warnings on cigarette packets,³⁷ and increased smoking restrictions inside licensed premises.³⁸ These activities may have improved the recruitment rate.

Quitlines should consider active telephone recruitment given its potential to substantially increase the proportion and types of smokers exposed to services at a reasonable cost. This could be achieved via existing population-based telephone surveys or a dedicated cold calling approach.

Acknowledgments

This project was undertaken by the Centre for Health Research & Psycho-oncology (CHeRP) and Hunter New England Population Health (HNEPH). CHeRP is funded by The Cancer Council NSW, The University of Newcastle and receives infrastructure support from the Hunter Medical Research Institute and the University of Newcastle Priority Research Centre for Health Behaviour. HNEPH is a unit of Hunter New England Health and receives infrastructure support from the Hunter Medical Research Institute and the University of Newcastle Priority Research Centre for Health Behaviour. The project received funding from the Australian Research Council, National Heart Foundation, Hunter New England Population Health and The Cancer Council NSW. The authors would like to sincerely thank the staff at the NSW Quitline and The Cancer Institute NSW for providing the proactive telephone counseling and the NSW Health Survey Program, Centre for Epidemiology and Research for supplying the NSW Population Health Survey data. We are very grateful to Prof Ron Borland for his helpful and generous advice and to Sarah Duncan, Vibeke Hansen and Amy Waller for their assistance with data collection. The views expressed are not necessarily those of The Cancer Council NSW and Hunter New England Health.

References

1. Stead LF, Perera R, Lancaster T. Telephone counselling for smoking cessation. The Cochrane Database of Systematic Reviews 2006(Issue 1):. Art. No.: CD002850. DOI: 10.1002/14651858.CD002850.
2. Pan W. Proactive telephone counseling as an adjunct to minimal intervention for smoking cessation: a meta-analysis. *Health Educ Res* 2006;21(3):416-427.

3. Hopkins DP, Briss PA, Ricard CJ, Husten CG, Carande-Kulis VG, Fielding JE, et al. Reviews of evidence regarding interventions to reduce tobacco use and exposure to environmental tobacco smoke. *Am J Prev Med* 2001;20(2 SUPPL.):16-66.
4. Fiore MC, Jaen CR, Baker TB et al. Treating Tobacco Use and Dependence: 2008 Update. Clinical Practice Guideline. Rockville MD: U.S. Department of Health and Human Services. Public Health Service; May 2008.
5. McDonald PW. Population-based recruitment for quit-smoking programs: an analytic review of communication variables. *Prev Med* 1999;28(6):545-557.
6. Farrelly MC, Hussin A, Bauer UE. Effectiveness and cost effectiveness of television, radio and print advertisements in promoting the New York smokers' quitline. *Tob Control* 2007;16(Suppl_1):i21-23.
7. Miller CL, Wakefield M, Roberts L. Uptake and effectiveness of the Australian telephone Quitline service in the context of a mass media campaign. *Tob Control* 2003;12:ii53-ii58.
8. Zhu S-H, Anderson CM, Johnson CE, Tedeschi G, Roeseler A. A centralised telephone service for tobacco cessation: the California experience. *Tob Control* 2000;9(Suppl II):ii48-ii55.
9. Swartz Woods S, Haskins AE. Increasing reach of quitline services in a US state with comprehensive tobacco treatment. *Tob Control* 2007;16(Suppl_1):i33-36.
10. Perry RJ, Keller PA, Fraser D, Fiore MC. Fax to quit: a model for delivery of tobacco cessation services to Wisconsin residents. *WMJ* 2005;104(4):37-40, 44.
11. Wolfenden L, Wiggers J, Campbell E, Knight J, Kerridge R, Moore K, et al. Feasibility, acceptability, and cost of referring surgical patients for postdischarge cessation support from a quitline. *Nicotine Tob Res* 2008;10(6):1105-1108.

12. Willett JG, Hood NE, Burns EK, Swetlick JL, Wilson SM, Lang DA, et al. Clinical faxed referrals to a tobacco quitline. Reach, enrollment, and participant characteristics. *Am J Prev Med* 2009;36(4):337-340.
13. Borland R, Balmford J, Bishop N, Segan C, Piterman L, McKay-Brown L, et al. In-practice management versus quitline referral for enhancing smoking cessation in general practice: a cluster randomized trial. *Fam Pract* 2008;25(5):382-9.
14. Platt S, Tannahill A, Watson J, Fraser E. Effectiveness of antismoking telephone helpline: follow up survey. *BMJ* 1997;314(7091):1371-1375.
15. Ossip-Klein DJ, McIntosh S. Quitlines in North America: evidence base and applications. *Am J Med Sci* 2003;326(4):201-5.
16. Owen L. Impact of a telephone helpline for smokers who called during a mass media campaign. *Tob Control* 2000;9(2):148-154.
17. Cummins SE, Bailey L, Campbell S, Koon-Kirby C, Zhu S-H. Tobacco cessation quitlines in North America: a descriptive study. *Tob Control* 2007;16(Suppl_1):i9-15.
18. Fiore MC, Croyle RT, Curry SJ, Cutler CM, Davis RM, Gordon C, et al. Preventing 3 million premature deaths and helping 5 million smokers quit: a national action plan for tobacco cessation. *Am J Public Health* 2004;94(2):205-10.
19. Paul CL, Wiggers J, Daly JB, Green S, Walsh RA, Knight J, et al. Direct telemarketing of smoking cessation interventions: will smokers take the call? *Addiction* 2004;99(7):907-913.
20. Carlini BH, Zbikowski SM, Javitz HS, Deprey TM, Cummins SE, Zhu S-H. Telephone-based tobacco-cessation treatment: re-enrollment among diverse groups. *Am J Prev Med* 2008;35(1):73-6.

21. Van Deusen AM, Hyland A, Abrams SM, Celestino P, Mahoney MC, Cummings KM. Smokers' acceptance of "cold calls" offering quitline services. *Tob Control* 2007;16(Suppl_1):i30-32.
22. Lando HA, Hellerstedt WL, Pirie PL, McGovern PG. Brief supportive telephone outreach as a recruitment and intervention strategy for smoking cessation. *Am J Public Health* 1992;82(1):41-46.
23. Curry SJ, McBride C, Grothaus LC, Louie D, Wagner EH. A randomized trial of self-help materials, personalized feedback, and telephone counseling with nonvolunteer smokers. *J Consult Clin Psychol* 1995;63(6):1005-1014.
24. Abdullah ASM, Mak YW, Loke AY, Lam T-H. Smoking cessation intervention in parents of young children: a randomised controlled trial. *Addiction* 2005;100(11):1731-1740.
25. Prout MN, Martinez O, Ballas J, Geller AC, Lash TL, Brooks D, et al. Who uses the Smoker's Quitline in Massachusetts? *Tob Control* 2002;11(Suppl 2):ii74-75.
26. Abdullah ASM, Lam TH, Chan SSC, Hedley AJ. Which smokers use the smoking cessation Quitline in Hong Kong, and how effective is the Quitline? *Tob Control* 2004;13:415-421.
27. Fortmann SP, Killen JD. Who shall quit? Comparison of volunteer and population-based recruitment in two minimal-contact smoking cessation studies. *Am J Epidemiol* 1994;140(1):39-51.
28. McBride CM, Curry SJ, Grothaus LC, Rosner D, Louie D, Wagner EH. Use of self-help materials and smoking cessation among proactively recruited and volunteer intervention participants. *Am J Health Promot* 1998;12(5):321-324.
29. Lindstrom M. Desire to stop smoking among intermittent and daily smokers: a population-based study. *Tob Control* 2001;10(4):396-7.

30. Heatherton TF, Kozlowski LT, Frecker RC, Fagerstrom KO. The Fagerstrom Test for Nicotine Dependence: a revision of the Fagerstrom Tolerance Questionnaire. *Br J Addict* 1991;86(9):1119-27.
31. Gilpin EA, Pierce JP, Berry CC, White MM. Technical Report on Analytic Methods and Approaches Used in the 1999 California Tobacco Survey Analysis. Vol 1: Data Collection Methodology. La Jolla, CA: University of California, San Diego; 2000.
32. Centre for Epidemiology and Research. 2006 Report on Adult Health from the New South Wales Population Health Survey. Sydney: NSW Department of Health; 2007.
<http://www.health.nsw.gov.au/publichealth/surveys/index.asp>. Accessed 26/10/2007.
33. Paul C, Paras L, Walsh RA, Tzelepis F, Tang A, Oakes W, et al. Tracking NSW Community Attitudes and Practices in relation to Tobacco: a Biennial Telephone Survey. Newcastle: Centre for Health Research & Psycho-oncology; 2007.
34. Mosbaek CH, Austin DF, Stark MJ, Lambert LC. The association between advertising and calls to a tobacco quitline. *Tob Control* 2007;16(Suppl_1):i24-29.
35. Gilbert H, Sutton S, Sutherland G. Who Calls QUIT®? The characteristics of smokers seeking advice via a telephone helpline compared with smokers attending a clinic and those in the general population. *Public Health* 2005;119(10):933-939.
36. Cotter T, Perez DA, Dessaix AL, Bishop JF. Smokers respond to anti-tobacco mass media campaigns in NSW by calling the Quitline. *NSW Public Health Bull* 2008;19(3-4):68-71.
37. Sanders S. Australia: WARNING: outdated pack health warnings are addictive to tobacco companies. *Tob Control* 2007;16(5):296.
38. NSW Department of Health. What licensed venues need to know: amendments to the Smoke-free Environment Act 2000. NSW Department of Health; 2005.

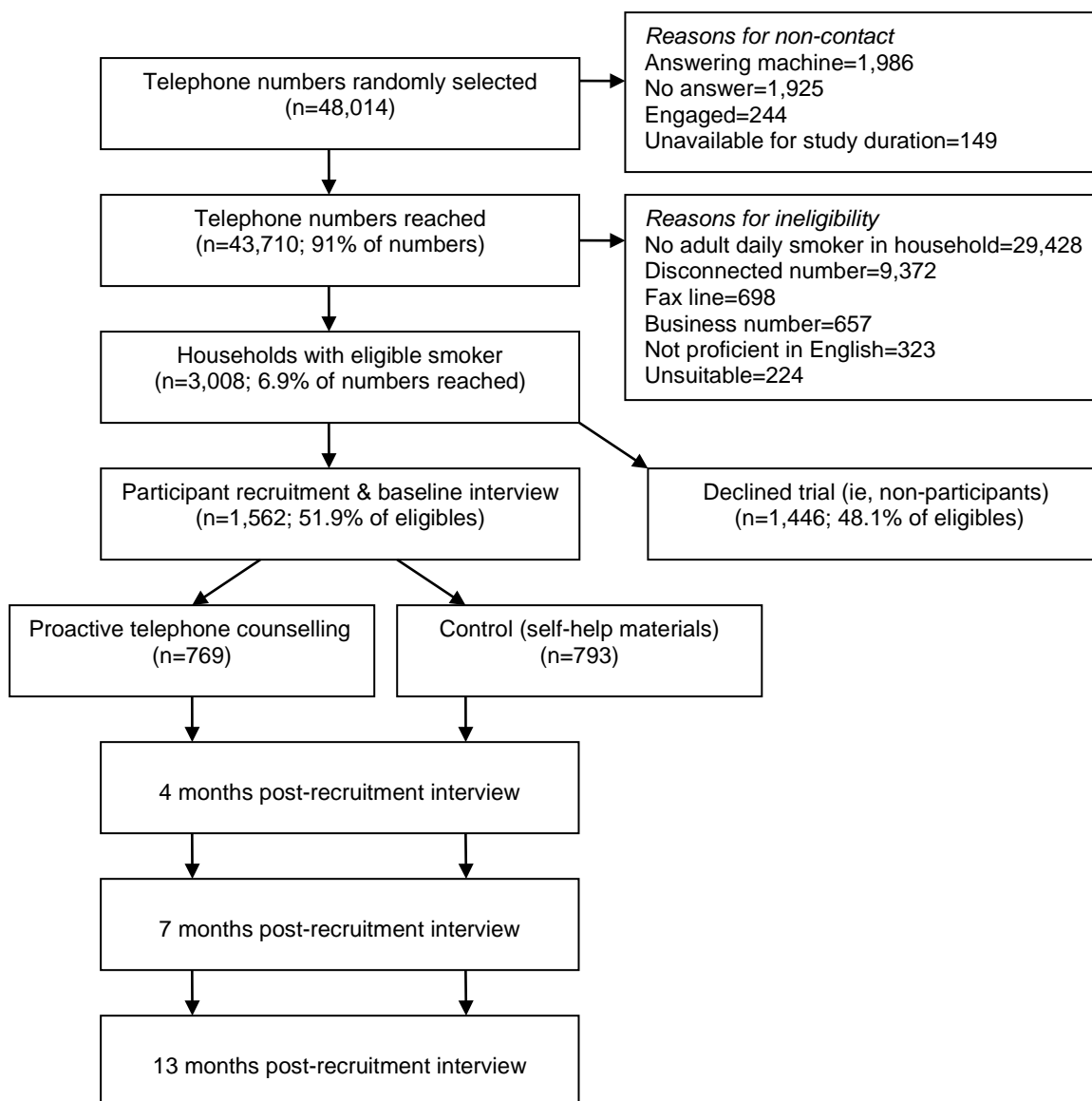


Figure 1: Participant recruitment and follow-up assessments

Table 1: Trial participants: comparisons with N.S.W. Population Health Survey on main demographic variables

Characteristic	Participants (n=1562)^a	N.S.W. adult daily smokers (from N.S.W. Population Health Survey)^b (n=1103)	p value
Gender (%)			
Male	49.4	53.7	0.03
Female	50.6	46.3	
Age (years)			
Mean (SD)	44.9 (13.3)	41.4 (14.3)	<0.0001*
Median	45	41	
Country of birth (%)			
Australia	80.9	77.6	0.04
Other	19.1	22.4	
Education (%)			
Primary only	1.0	1.7	<0.0001*
Year 7-10	32.1	27.0	
HSC/TAFE ^c	46.4	54.7	
University or tertiary	18.7	13.9	
Other	1.9	1.5	
Don't know	0	1.3	
Private health insurance (%)			
Yes	38.0	33.3	0.04
No	61.1	66.0	
Don't know	0.9	0.7	
Household members			
Mean (SD)	2.9 (1.5)	3.2 (1.7)	<0.0001*
Median	3	3	

^a number of missing cases range from 0-3

^b weighted according to age and gender breakdowns in the Australian Bureau of Statistics 2005 mid-year population estimates

^c HSC=Higher School Certificate; TAFE=Technical and Further Education

* p<0.01

Table 2: Trial participants: comparisons with CHeRP Smoking Community Survey on smoking-related and supplementary demographic variables

Characteristic	Participants (n=1562) ^a	N.S.W. adult daily smokers (from CHeRP Survey) ^b (n=586)	p value
Aboriginal or Torres Strait Islander origin (%)			
Aboriginal/Torres Strait Islander	2.2	1.4	0.2
No/don't know	97.8	98.6	
Marital status (%)			
Married/living with partner	55.1	47.9	<0.0001*
Divorced/Separated	20.1	14.8	
Widowed	4.3	4.2	
Never married	20.6	33.1	
Employment (%)			
Employed full time	44.9	49.0	0.03
Employed part time/casual	19.7	20.3	
Unemployed	6.5	7.5	
Student	2.3	2.2	
Retired	10.6	11.1	
Permanently unable to work	5.3	2.7	
Home duties	8.4	6.2	
Other	2.4	1.0	
Area of residence (%)			
Metropolitan	42.7	61.0	<0.0001*
Non-metropolitan	57.3	39.0	
Time to first cigarette (minutes)			
Mean (SD)	51.3 (100.8)	79.3 (148)	<0.0001*
Median	20	30	
Cigarettes per day			
Mean (SD)	19.4 (9.8)	16.1 (9.7)	<0.0001*
Median	20	15	
Quit attempt in past 12 months (%)			
Yes	47.5	49.3	0.4
No	52.5	50.7	
Longest abstinence in past 12 months (days) (of those quitting in past 12 months)			
	(n=736)	(n=289)	
Mean (SD)	29.1 (49.0)	48.5 (76.4)	<0.0001*
Median	7	14	

Table 2: Continued

Characteristic	Participants (n=1562) ^a	N.S.W. adult daily smokers (from CHeRP Survey) ^b (n=586)	p value
Quitting strategies on most recent quit attempt (of those quitting in past 12 months)	(n=736)	(n=289)	
Nicotine replacement therapy	40.8	39.5	0.7
General practitioner advice	13.0	14.8	0.5
Self-help manual	8.4	8.7	0.9
Bupropion	5.4	4.6	0.6
Quitline/telephone support	3.8	7.1	0.03
Group counseling	1.8	0.9	0.3
Quitting intentions (%)			
Will quit in next 30 days	27.9	16.5	<0.0001*
Will quit in next 6 months	39.8	29.0	
Will not quit in next 6 months	27.8	48.9	
Don't know	4.5	5.6	
Other household smokers (%)			
Yes	24.5	40.9	<0.0001*
No	75.5	59.1	

^a number of missing cases range from 0-12

^b weighted as per the age and gender distributions in the 2006 Australian Bureau of Statistics census

* p<0.01