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Evaluating the effectiveness of proactive telephone counselling for smoking cessation in a randomized controlled trial

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ABSTRACT

Aim To evaluate the effectiveness of repeated-contact proactive telephone counselling for smoking cessation in a UK setting. **Design** Randomized controlled trial. **Setting** The Quitline®, an established national telephone counselling service available throughout the UK. **Participants and intervention** A total of 1457 callers to the Quitline in 2000 and 2001 were allocated randomly to a Control group to receive usual care or to a Repeated Contact group to be offered five proactive calls in addition to usual care. **Measurements** Prolonged abstinence and 24-hour point-prevalent abstinence 6 and 12 months after recruitment, quit attempts and 24-hour periods of abstinence in non-quitters. **Findings** No significant differences were found between the Repeated Contact and Control groups on prolonged or point-prevalent abstinence. On an intention-to-treat basis, 9.5% of the Control group were abstinent for longer than 6 months at the 12-month follow-up, compared with 9.3% of the Repeated Contact group; 18.9% and 20.2%, respectively, were point-prevalent abstinent at the 6-month follow-up. Significantly more non-quitters in the Control group made a quit attempt in the first 6 months following recruitment than in the Repeated Contact group (62.6%/56.1%, $P < 0.05$). **Conclusions** Proactive telephone counselling did not significantly increase abstinence rates, and appeared to decrease quit attempts, in callers to the Quitline. A non-structured, client-led counselling protocol and insufficient pre-quit motivational counselling could account for the lack of effect.

Keywords Proactive counselling, Quitline, smoking cessation, telephone helplines.

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INTRODUCTION

It is estimated that of all deaths in middle age, 23% are attributed to smoking (Peto *et al.* 2003), and despite a massive decline since 1950 the prevalence of smoking in the United Kingdom has remained at around 27% for over a decade (Walker *et al.* 2002). Specialist clinics offering intensive face-to-face treatment have increased in number following government initiatives (Secretary of State for Health 1998). However, in spite of their increasing availability, the majority of smokers do not make use of these clinics, most preferring to quit on their own (Fiore *et al.* 1990; Cokkinides *et al.* 2005). Developing new ways of encouraging more quit attempts and improving the success rate of self-quit attempts is essential if we are to continue to reduce adult smoking and mortality from smoking-related diseases in Britain.

Telephone helplines represent a more flexible and convenient method of providing advice to those seeking minimal assistance (Orleans *et al.* 1991; Ossip-Klein *et al.* 1991; Zhu *et al.* 1996a). While quit rates are likely to be lower for helplines than for clinics, their great advantage is their ability to reach very large numbers of smokers at relatively low cost. With a potential audience far larger than that of groups and clinics, a relatively small success rate in percentage terms can have a major impact in terms of the yield of ex-smokers, and holds enormous public health potential.

Telephone counselling comes in two forms: reactive, where the smoker initiates the call to a designated number to receive advice and information; and proactive, where a trained counsellor initiates the call to the smoker. It has been suggested that reactive telephone counselling may be an effective aid to smoking cessation (West,

McNeill & Raw 2000). Two surveys of UK helpline callers during campaign periods have indicated that a high proportion of callers engage in quitting activity following a call to a helpline, and estimate that approximately one-quarter of callers will be point-prevalent abstinent 1 year later (Platt *et al.* 1997; Owen 2000). However, helplines are difficult to evaluate in randomized trials, because the lack of an appropriate comparison group makes it impossible to assess whether rates are higher than they would have been without counselling.

Meta-analyses of studies of proactive counselling have reported modest, significant, pooled effect sizes. Although the use of different definitions of abstinence make it difficult to draw firm conclusions, Lichtenstein *et al.* (1996) and Stead & Lancaster (2001) concluded that proactive telephone counselling shows consistent beneficial effects and increases the chances of quitting. Based on the premise that 'more is better', multiple telephone counselling sessions have produced significantly higher abstinence rates than single sessions (Zhu *et al.* 1996a; Borland *et al.* 2001). Success has been achieved with scheduling calls to coincide with the peak time of relapse in a fixed schedule (Zhu *et al.* 1996a) and with a series of brief proactive telephone counselling calls at times negotiated to suit the caller (Borland *et al.* 2001).

The aim of this study was to see if an intervention shown to be effective in other countries can be generalized to a UK setting with an established national telephone counselling service. The Quitline®, run by the charity QUIT®, currently offers reactive counselling via a freephone line available throughout the United Kingdom. We planned to replicate the repeated-contact protocol developed by the University of California San Diego (UCSD) (Zhu *et al.* 1996a) adapted to the UK context. We hypothesized that repeated contact, in which the counsellor, with the consent of the caller, made a number of follow-up calls according to a specified schedule, would significantly increase both the long-term and point-prevalent abstinence rate compared with usual care.

The Quitline service

The Quitline opened in 1988, and in 1995 became the first freephone telephone service in the United Kingdom. At the time of the study, opening hours of the line varied between 9 a.m. and 9 p.m., allowing for seasonal fluctuations. Outside opening hours the caller could leave a name and address for information on an answering machine, and was asked to call back at the appropriate time for counselling. Approximately 130 counsellors, 50% of whom worked a typical week of eight 4–5-hour shifts, operated the line. All counsellors have a British Association for Counselling (BAC) recognized certificate in counselling, many having higher qualifications, and all receive between 25 and 30 hours of training in telephone counselling and smoking cessation. Since its inception, a tradition of anonymity and confidentiality has evolved as an important aspect of the Quitline service, and a specific culture has developed from the provision of a sensitive, empathic counselling service which, while incorporating the essential elements of smoking cessation advice, is non-structured and client-led. The deliberate omission of a frontscreen allows callers to speak immediately to a counsellor. Callers to the Quitline are more likely to be female and are more heavily dependent compared with a general population sample of smokers, although the age profile of helpline callers corresponds closely to that of the general population of smokers (Gilbert, Sutton & Sutherland 2005).

METHOD

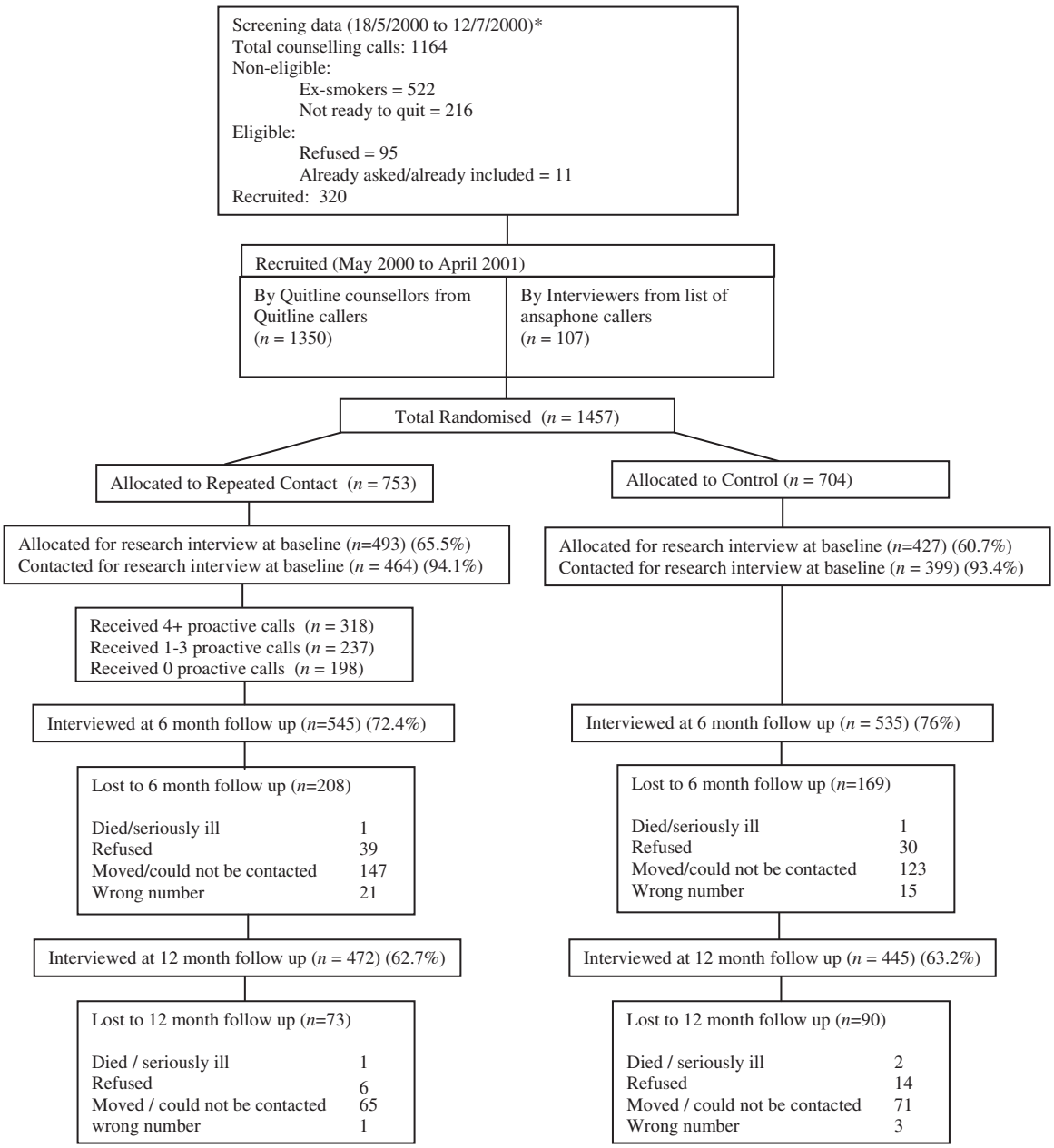
Participants and design

Participants ($n = 1457$) were recruited between May 2000 and April 2001. The majority (92.7%) were recruited when they called the Quitline ($n = 1350$); these were supplemented by participants recruited from a list of callers leaving their telephone numbers on the Quitline answerphone ($n = 107$). Figure 1 shows the progress of participants through the study.

After dealing with the immediate reason for the call, counsellors screened all callers engaging in counselling for eligibility. Participants had to: (i) receive counselling; (ii) be current smokers ready to quit within 2 weeks or quit for not more than 1 day; and (iii) be 18 or over. Eligible callers were invited to take part in the study using a scripted introduction; informed consent was obtained by the caller giving their name, address and telephone number. Based on the logging of all calls during the first 8 weeks of the study (Gilbert *et al.* 2005), approximately 10% of callers over 18 engaged in counselling, 36.6% of these were eligible for the study in terms of readiness to quit, and 77.7% of these agreed to participate.

All participants had already received counselling during their initial call, as well as the offer of the standard QUIT information pack, before being allocated randomly to either a Control group with no more counselling contact, or to a Repeated Contact group to receive five additional proactive calls initiated by the counsellor. Assignment to a treatment group was effected by dividing days randomly, in blocks of 8 weeks, into two equal sets. Allocation to treatments depended on which day they called the Quitline, and distribution of days of the week was similar in the two conditions.

Detailed information was collected from a randomly selected group of participants ($n = 863$, 59.2%) by telephone, by a researcher, within a few days of recruitment. While collecting more extensive data from this population of smokers was important for analysis and prediction



*screening data was collected for the first eight weeks of the trial only to avoid putting the extra burden on the counsellors of collecting this data continuously throughout the study.

Figure 1 Flowchart of the progress of participants through the trial.

of quit attempts, it was considered that too many research questions would over-burden the counsellors and interfere with the counselling process. Time and resources did not allow for all participants to be contacted for this baseline interview, which was purely for research purposes, and was conducted before any proactive contact from counsellors.

Counsellors were unaware to which group the caller would be allocated when recruiting, and interviewers were blind to the allocation until after the baseline interview had taken place.

Counselling protocol

Participants in the Repeated Contact group were contacted after their baseline interview by a counsellor and offered five additional counselling calls made to them by a Quit counsellor. On agreement, the first call was arranged to coincide with their planned quit date.

The suggested schedule, based loosely on the multiple-session telephone counselling intervention designed by Zhu *et al*. (1996a) at UCSD, planned three calls in the first week after quitting, one call after 2 weeks and one call after 4 weeks, to provide the most intensive support during the first week of the quit attempt. However, anticipating difficulties of adhering strictly to a fixed schedule, we allowed counsellors and clients more flexibility, the timing of calls agreed between caller and counsellor. Calls were made by any available counsellor, and brief notes made to enable the next counsellor to continue with appropriate counselling. For each proactive call, if no contact was made on the first attempt, five further attempts were made to contact the participant before they were assumed to be lost to the intervention. To reflect the counselling protocol of the UCSD helpline, guidelines suggested the inclusion of enhancing motivation to change, increasing self-efficacy and developing effective strategies to cope with temptation, changing self-image and dealing with abstinence violation and attribution of failure. Later sessions were to include more relapse prevention content than motivational. However, based on the experience of Quitline counsellors, we considered that UK callers would prefer shorter sessions, and we also accepted the Quitline tradition of non-structured counselling and made a decision not to make changes to the current practice.

Baseline measures

Information collected by counsellors during the initial call included: gender, age, current smoking status, cigarette consumption, time from waking to first cigarette, age started smoking, past quit attempts, longest period of abstinence, readiness to quit and date of planned quit attempt, if set. Additional information, including motivation to quit, was collected in the baseline research interview.

Outcome measures

Participants were contacted by telephone by a researcher 6 and 12 months after recruitment to ascertain their smoking status, using a tight and accurate measure (Mullins & Borland 1998). Those who could not be contacted after numerous attempts were sent a letter by post asking for a contact number or convenient time for contact, before being classified as lost to follow-up.

The primary outcome measure was prolonged abstinence at the 6- and 12-month follow-ups, defined as no smoking of cigarettes for the last 1, 3 or 6 months, and the reporting of no slip-ups and no use of other tobacco products. Prolonged abstinence allows a grace period between the start of the trial and quitting, and is considered to be the best measure for treatments that may have a delayed effect (Hughes *et al*. 2003). Secondary outcome measures were 24 hour point-prevalent abstinence at 6 and 12 months. Quit attempts and 24-hour periods of abstinence were assessed in non-quitters.

Other measures

The perceived usefulness of the additional proactive telephone counselling was evaluated at the 6-month follow-up and, to confirm the information recorded by the counsellor on the number of proactive calls made, participants were asked how many calls they had received and how many times they had called the Quitline, in addition to the first call.

Data analysis

All analyses were performed on an intention-to-treat basis; all participants who were not contacted for the follow-up interviews were considered to be smokers who never quit. The original target sample size was 3000, which would have given 90% power to detect a difference in quit rate between 5% and 8%, assuming a two-tailed test and alpha of 0.05 (Borenstein & Cohen 1988). Slower than expected recruitment meant that the target sample size had to be revised. A *post-hoc* power calculation showed that a sample size of 750 per condition gave 65% power to detect a difference of this size.

RESULTS

Attrition and baseline equivalence

Participants were recruited evenly from all parts of the United Kingdom, reflecting the composition of calls to the Quitline. The mean age at recruitment was 39.3 (SD 13.0) and 65.8% were female, 42.6% of participants planned to quit in the next 2 weeks but had not set a quit date, 52.2% had set a quit date within the next 2 weeks and 5.3% had already quit.

Significantly more of those recruited from the answerphone list were allocated to the Control group ($P < 0.01$), and slightly more of the Repeated Contact group were contacted for additional data at baseline ($P < 0.05$). These measures were controlled for in the outcome analysis. The mean length of the initial counselling call, which also included approximately 10 minutes of screening and introduction to the research, was significantly longer in the Control group than the Repeated Contact group ($P < 0.001$). There were no differences between the Repeated Contact and Control groups on any demographic, dependence, readiness to quit or motivation measures (Table 1).

Attrition rates were 25.9% and 37.1% at the 6- and 12-month follow-ups, respectively. There were no differences in attrition between the two conditions.

Table 1 Participant characteristics.

	All	*Control group*	*Repeated contact group*	
All participants		704 (48.3%)	753 (51.7%)	
Additional interview at baseline (%)	59.2	56.7	61.6	$\chi^2 = 3.68$, $P < 0.055$
Recruited from answerphone (%)	7.3	9.2	5.6	$\chi^2 = 7.14$, $P < 0.008$
Demographics				
Female (%)	65.8	64.2	67.2	
Mean age at recruitment	39.3	39.1	39.6	
Index of dependence (1–6)	3.3	3.3	3.3	
(Sum of cigarettes per day and time from waking)				
Set quit date (%)				
No	42.6	44.9	40.4	
Yes	52.2	50.7	53.3	
Already quit	5.3	4.4	6.1	
Mean motivation	4.63	4.64	4.61	
[how much do you want to quit? (1–5)]				
Mean determination	4.58	4.58	4.57	
[how determined are you to quit for good? (1–5)]				
Mean Townsend index score*	0.85	0.97	0.73	
Mean length of initial counselling call (minutes)	($n = 1299$) 16.55	($n = 610$) 17.29	($n = 689$) 16.24	$t = 2.57$, $P < 0.01$

*A deprivation score derived by matching residential postcode to census information available at enumeration district level (Townsend, Phillimorse & Beattie 1988). Score of zero represents the national average, negative values below-average levels of deprivation and positive values higher than average.

Counselling intervention and adherence to the counselling schedule

Of the 753 participants allocated to the Repeated Contact group, 198 (26.3%) received no additional counselling calls, 237 (31.5%) received between one and three calls and 318 (42.2%) received four calls or more. The mean number of proactive counselling calls received per participant was 2.7.

Difficulty contacting clients, the lack of a specific quit date in many cases and clients requesting calls a few months later when they would make another attempt meant that the specified counselling schedule was difficult to adhere to in practice. Of the first proactive counselling calls, 50% took place within 3 days of the planned quit date and 90% within 8 days, ranging from 8 days before to 15 weeks after. Half of the final counselling calls were made within 6 weeks of the quit date, ranging from 5 days before to 24 weeks after. For clients with no planned quit date, calls were designated to take place seven days after recruitment, but in practice were made between 1 day and 15 weeks after recruitment. For participants who received only one call, the first counselling call was also their final one. Proactive calls varied in length from 1 to 70 minutes, with a mean length of 9.4 minutes.

Perceived usefulness of counselling

Participants in the Repeated Contact group were asked to rate the usefulness of the proactive counselling calls, and to indicate what they thought was the most useful purpose of the counselling. The mean rating for usefulness was 3.6 (SD 1.3) (on a scale of 1–5). Having someone to talk to or to listen was cited most frequently as the most useful purpose (34.7%); emotional support (19.6%) and practical advice (17.5%) were the next most cited. Motivation (7.9%) and accountability (6.3%) were the least frequently mentioned.

Recall of reactive and proactive calls

The number of recorded proactive calls and the number of reported proactive calls correlated significantly ($r = 0.46$, $P < 0.0001$). However, the mean number of reported calls was significantly lower than recorded calls (2.7/3.0) ($t_{(521)} = 2.48$, $P < 0.05$) in those participants who completed the 6-month follow-up ($n = 521$), showing some evidence of recall bias.

A substantial minority of participants called the Quitline twice (17.2%) or three or more times (17.3%). The number of reactive calls was not significantly different between the two groups (Control group mean = 2.28, Repeated Contact group mean = 1.95) suggesting that the Repeated Contact group was using the reactive service as much as the Control group in spite of the additional service. There was also no relationship between the number of reactive and proactive calls, either recorded or reported, in the Repeated Contact group, and therefore no suggestion that proactive calls replaced reactive calls for the minority that made multiple use of the helpline.

Outcome

Abstinence rate

There were no significant differences between the Repeated Contact and Control groups on prolonged or point-prevalent measures of abstinence at the 6- or 12-month follow-ups (Table 2). Overall, 11.8% of all participants reported prolonged abstinence of at least 3 months 6 months after recruitment, and 9.4% of all participants had remained abstinent for longer than 6 months at the final interview.

Quit attempts in participants smoking at follow-ups

To investigate the effect of telephone counselling on promoting quit attempts, we examined quit attempts in non-quitters, defined as daily smokers, occasional smokers (who may also be 24 hour point-prevalent abstinent) and those lost to follow-up (who were assumed to be smoking). The proportion of non-quitters (of a total of 1210) who had made a quit attempt in the first 6 months after recruitment was significantly higher in the control group (62.6%) than in the repeated contact group (56.1%) ($\chi^2_{(1)} = 5.25$, $P < 0.05$). More were lost to follow-up from the Repeated Contact group; if those lost to follow-up are excluded, the difference becomes non-significant (87.8%/84.3%). The number who had been abstinent for at least 24 hours during the first 6 months after recruitment was also non-significantly higher in the Control group (Table 3). There was no difference in the number of quit attempts and abstinences between the groups between months 6 and 12.

Relationship between number of calls, determination and abstinence

To investigate the effect of the number of calls received on abstinence in the repeated contact group, number of calls was collapsed into three groups. Participants who received four or more proactive calls had significantly higher rates of prolonged and point-prevalent abstinence at the 6-month follow-up, and of prolonged abstinence at the 12-month follow-up (Table 4).

Age and baseline scores on wanting to quit and determination to quit were associated with receiving four or more proactive counselling calls ($t_{(745)} = 2.72$, $P < 0.01$; $t_{(461)} = 2.63$, $P < 0.01$; $t_{(459)} = 2.79$, $P < 0.01$). Age was also associated with prolonged abstinence of greater than 6 months at the 12-month follow-up ($t_{(745)} = 2.73$, $P < 0.01$), and determination with prolonged abstinence of greater than 3 months at the 6-month follow-up ($t_{(459)} = 2.58$, $P < 0.05$). A logistic regression analysis showed that, when age and determination were taken into account, receiving four or more calls increased the odds of being abstinent for at least 6 months at the 12-month follow-up by a factor of 1.8 ($P = 0.066$).

Table 2 Prolonged and point-prevalent abstinence at the 6- and 12-month follow-ups.

	All *f (%) (95% CI)*	*Control group* *f (%)*	*Repeated contact group* *f (%)*	*% difference (95% CI)*
6-month follow-up				
3 months prolonged abstinence	172 (11.8) (10.2 to 13.6)	82 (11.6)	90 (12.0)	0.4 (−3.6 to 3.0)
1-month prolonged abstinence	211 (14.5) (12.8 to 16.4)	97 (13.8)	114 (15.1)	1.3 (−2.3 to 5.0)
24 hour point-prevalent abstinence	285 (19.6) (17.6 to 21.7)	133 (18.9)	152 (20.2)	1.3 (−2.8 to 5.4)
12-month follow-up				
6 months prolonged abstinence	137 (9.4) (8.0 to 11.0)	67 (9.5)	70 (9.3)	−0.2 (−3. to 2.8)
24 hour point-prevalent abstinence	258 (17.7) (15.8 to 19.8)	126 (17.9)	132 (17.5)	−0.4 (−4.3 to 3.5)

Table 3 Quit attempts and 24 hour abstinence in non-quitters.

	All *f (%) (95% CI)*	*Control group* *f (%)*	*Repeated contact group* *f (%)*	*% difference (95% CI)*
1–6 months after recruitment ($n = 1210$)				
Quit attempt	717 (59.3) (56.5 to 62)	368 (62.6)	349 (56.1)	−6.5* (−12.0 to −0.9)
At least 24 hours abstinence	650 (53.7) (50.9 to 56.5)	331 (56.3)	319 (51.3)	−5.0 (−10.6 to −0.6)
6–12 months after recruitment ($n = 1232$)				
Quit attempt	379 (30.8) (28.2 to 33.4)	185 (31.2)	194 (30.4)	−0.8 (−6.0 to 4.3)
At least 24 hours abstinence	391 (31.7) (29.2 to 34.4)	181 (30.5)	210 (32.9)	2.4 (−2.9 to 7.5)

*$P < 0.05$.

Table 4 Abstinence rates in Repeated Contact group by number of calls received.

	0 calls *f (%)*	*1–3 calls* *f (%)*	*4 + calls* *f (%)*	*Total* *f (%)*	*% difference between 0 and 4 + calls (95% CI)*
6-month follow-up					
3 months prolonged	15 (7.6)	21 (8.9)	54 (17.0)	90 (12.0)	9.4* (3.5 to 14.8)
1 month prolonged	19 (9.6)	32 (13.5)	63 (19.8)	114 (15.1)	10.2** (3.9 to 16.0)
24 hour point-prevalent	26 (13.1)	40 (16.9)	56 (27.0)	152 (20.2)	13.9*** (6.8 to 20.4)
12-month follow-up					
6 months prolonged	10 (5.1)	18 (7.6)	42 (13.2)	70 (9.3)	8.1** (3.0 to 12.9)
24 hour point-prevalent	27 (13.6)	39 (16.5)	66 (20.8)	132 (17.5)	7.2 (3.0 to 13.4)

*$P < 0.001$; **$P < 0.005$; ***$P < 0.0005$.

DISCUSSION

In a partial replication of the work of Zhu and colleagues in a UK setting, this study compared the effects of reactive calling to the Quitline with the effects of offering five proactive calls in addition to reactive calls. The results indicated that there was no benefit from additional proactive counselling calls, to either long-term or point-prevalent abstinence. In those still smoking at the 6-month follow-up, a higher number of quit attempts in the control group suggests a possible detrimental effect of proactive counselling on the probability of making a quit attempt. Although the study was based on the UCSD programme, variations in practice and the adaptation of some procedures resulted in differences between the two studies.

A distinctive feature of the UCSD programme was a carefully structured counselling protocol with specified goals. Other studies of proactive counselling have also used a structured format and detailed protocol for the calls (e.g. Orleans *et al.* 1991; Curry *et al.* 1995), and several researchers have discussed the need for further research into the number, timing and content of counselling calls to determine which aspects and style of counselling might promote smoking cessation more than others (Lichtenstein *et al.* 1996; Owen 2000). Few studies have published details on the clinical content of telephone counselling and little attention has been paid to examining the optimal content, with the exception of the USCD study (Zhu *et al.* 1996b), where protocols were developed focusing on different phases of quitting, and structured questionnaires used in sequence for up to six sessions to guide the counselling. The first pre-quit session emphasized promoting motivation to change and engaging the client in a contract to make a quit attempt and later sessions gave more attention to relapse prevention.

A limitation of the current study is that little is known about the content and structure of the calls. While Quitline counsellors received training and were given a suggested protocol, a decision was made not to change the current QUIT practice of client-led counselling. However, non-structured counselling, led by the client, can result in being overly empathic regarding the difficulty of changing, with insufficient emphasis on reducing ambivalence and preparation for change. Evidence that this occurred can be found in the ratings of usefulness of the counselling, where empathy and emotional support was cited far more often than motivation.

Callers at UCSD were allocated to a counsellor who made all subsequent calls, ensuring continuity and a personal touch. In contrast, calls at QUIT were made by any available counsellor. While an Australian study claimed that it is possible to provide an effective service without the continuity of care from one therapist (Borland *et al.* 2001), that study evaluated an ongoing service where counsellors were already recording relevant information routinely, giving the client some structure and a sense of progress. At QUIT, counselling was organized around a once-only consultation rather than repeated contact, with repeated calls following the same pattern of advice. Continuity is an essential part of the service, and additional sessions should be structured and address different aspects of need.

Counselling sessions offered in the Repeated Contact condition in the present study also differed in both timing and scheduling from those offered by UCSD. The majority of calls were made on or after the planned or assumed quit date. In addition, difficulties in contacting clients and requests for calls at a later date when another attempt would be made meant that the relapse sensitive schedule was difficult to adhere to. Miguez, Vazquez & Becona (2002) suggested that timing calls to coincide with the quit day may be too late, and that more pre-quit counselling to prepare the quitter may be appropriate. A first counselling session well in advance of the planned quit date together with a structured protocol setting expectations and preparing for change, and engaging the client in a contract to make a quit attempt, would allow counsellors to address any ambivalence and to reaffirm motivation.

Participants at UCSD received a 50-minute pre-quit counselling session, and subsequent sessions were shorter but closer in format to the intensive one-to-one sessions offered in clinics. Zhu *et al.* (1996a) commented that 'to intervene effectively . . . within a limited time (about 50 minutes) is a challenging task' (p. 207). In comparison, the average Quitline counselling call lasted approximately 10 minutes, presenting an even greater challenge, and requiring close adherence to a structure to ensure objectives are met.

The overall abstinence rate from a single session reactive line was 9.4% for 6 months prolonged abstinence 1 year after the initial call to the Quitline. This is similar to rates found for reactive one-off calls on other helplines (Platt *et al.* 1997; Wakefield & Miller 1999; Zhu *et al.* 2002) and compares favourably with other brief interventions (West, McNeill & Raw 2000). More than two-thirds of all participants made an attempt to quit after calling the Quitline and more than 60% had a period of abstinence of at least 24 hours, confirming the quitting activity prompted by quitlines reported by others (Platt *et al.* 1997; Owen 2000). The lack of an untreated control group of smokers not using the helpline limits these conclusions, as there are no data against which these results can be compared. The rates given here are the most conservative, based on intention-to-treat rates, assuming that all those lost to follow-up are continuing smokers. In view of the population being served (Gilbert *et al.* 2005), these results imply that the reactive Quitline is offering a valuable service and is effective in promoting cessation.

Those participants who elected to adhere to the programme and received more calls had a significantly higher abstinence rate. This self-selected group was also distinguished by their greater determination and age. Although receiving at least four proactive calls increased the odds of prolonged abstinence when these factors were taken into account the increase was small, and the success rate associated with adherence may not be attributable to the extra calls.

In summary, the reactive service offered by the Quitline produces relatively high quit rates compared with other brief interventions. However, offering repeated contact calls in this study did not improve these quit rates. Further consideration of the content and structure of counselling calls and a closer replication of the USCD study is called for.

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References

Borenstein, M. & Cohen, J. (1988) *Statistical Power Analysis: a Computer Program*. Hillsdale, NJ: Erlbaum.

Borland, R., Segan, C. J., Livingstone, P. M. & Owen, N. (2001) The effectiveness of callback counselling for smoking cessation; a randomized trial. *Addiction*, **96**, 881–889.

Cokkinides, V. E., Ward, E., Jemal, A. & Thun, M. J. (2005) Under-use of smoking cessation treatments: results from the National Health Interview Survey, 2000. *American Journal of Preventive Medicine*, **28**, 119–122.

Curry, S. J., McBride, C., Grothaus, L. C., Louie, D. & Wagner, E. H. (1995) A randomised trial of self-help materials, personalised feedback, and telephone counselling with nonvolunteer smokers. *Journal of Consulting and Clinical Psychology*, **63**, 1005–1014.

Fiore, M. C., Novotny, T. E., Pierce, J. P., Giovino, G. A. & Hatziandreu, E. J. (1990) Methods used to quit smoking in the United States. Do cessation programs help? *JAMA*, **263**, 2760–2765.

Gilbert, H., Sutton, S. & Sutherland, G. (2005) Who Calls QUIT®? The characteristics of smokers seeking advice via a telephone helpline compared with those attending a clinic and with smokers in the general population. *Public Health*, **119**, 933–939.

Hughes, J. R., Keely, J. P., Niaura, R. S., Ossip-Klein, D. J. & Richmond, R. L. (2003) Measures of abstinence in clinical trials: issues and recommendations. *Nicotine and Tobacco Research*, **5**, 13–25.

Lichtenstein, E., Glasgow, R. E., Lando, H. A., Ossip-Klein, D. J. & Boles, S. M. (1996) Telephone counselling for smoking cessation: rationales and meta-analytic review of the evidence. *Health Education Research*, **11**, 243–257.

Miguez, M. C., Vazquez, F. L. & Becona, E. (2002) Effectiveness of telephone contact as an adjunct to a self-help program for smoking cessation: a randomized controlled trial in Spanish smokers. *Addictive Behaviors*, **27**, 139–144.

Mullins, R. & Borland, R. (1998) Changing the way smoking is measured among Australian adults: a preliminary investigation of Victorian data. *Quit Evaluation Studies*, **9**, 163–173.

Orleans, C. T., Schoenbach, V. J., Wagner, E. H., Quade, D., Salmon, M. A. & Pearson, D. C. (1991) Self-help quit smoking intervention: effects of self-help materials, social support intervention, and telephone counselling. *Journal of Consulting and Clinical Psychology*, **59**, 439–448.

Ossip-Klein, D. J., Giovino, G. A., Megahed, N., Black, P. M., Emont, S. L., Stiggins, J. *et al.* (1991) Effects of a smokers' hotline: results of a 10-county self-help trial. *Journal of Consulting and Clinical Psychology*, **59**, 325–332.

Owen, L. (2000) Impact of a telephone helpline for smokers who called during a mass media campaign. *Tobacco Control*, **9**, 148–154.

Peto, R., Lopez, A. D., Boreham, J. & Thun, M. (2003) *Mortality from Smoking in Developed Countries 1950–2000*, 2nd edn. Oxford: Oxford University Press. Available at: http://www.ctsu.ox.ac.uk/~tobacco/ (accessed 12 November 2004).

Platt, S., Tannahill, A., Watson, J. & Fraser, E. (1997) Effectiveness of antismoking telephone helpline: follow up survey. *BMJ*, **314**, 1371.

Secretary of State for Health (1998) *Smoking Kills: a White Paper on Tobacco*. London: Stationary Office.

Stead, L. F. & Lancaster, T. (2001) Telephone counselling for smoking cessation (Cochrane Review). *The Cochrane Library*, Issue 4. Oxford: Update Software.

Townsend, P., Phillimorse, P. & Beattie, A. (1988) *Health and Deprivation: Inequality and the North*. Croom-Helm, London.

Wakefield, M. & Miller, C. (1999) Evaluation of the national quitline service. In: Hassard. K., ed. *Australia's National Tobacco Campaign: Evaluation Report*, vol. 1, chapter 3, pp. 83–106. Canberra: Commonwealth Department of Health and Aged Care.

Walker, A., O'Brien, M., Traynor, J., Fox, K., Goddard, E. & Foster, K. (2002) *Living in Britain: Results from the 2001 General Household Survey*. London: Stationary Office.

West, R., McNeill, A. & Raw, M. (2000) Smoking cessation guidelines for health professionals: an update. *Thorax*, **55**, 987–999.

Zhu, S.-H., Anderson, C. M., Tedeschi, G. J., Rosbrook, B. & Johnson, C. E. (2002) Evidence of real-world effectiveness of a telephone quitline for smokers. *New England Journal of Medicine*, **347**, 1087–1093.

Zhu, S.-H., Stretcher, V., Balabanis, M., Rosbrook, B., Sadler, G. & Pierce, J. P. (1996a) Telephone counseling for smoking cessation: effects of single-session and multiple-session interventions. *Journal of Consulting and Clinical Psychology*, **1996**, 202–211.

Zhu, S.-H., Tedeschi, G. J., Anderson, C. M. & Pierce, J. P. (1996b) Telephone counselling for smoking cessation: what's in a call? *Journal of Counselling and Development*, **75**, 93–102.

