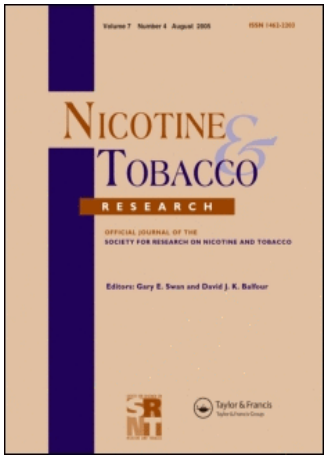

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Telephone booster sessions for optimizing smoking cessation for patients in rehabilitation centers

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Telephone booster sessions for optimizing smoking cessation for patients in rehabilitation centers

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Smokers with smoking-related diseases who are hospitalized in rehabilitation centers should be offered smoking cessation. This is the first study evaluating whether telephone booster sessions after intensive inpatient treatment are an effective strategy. The present study was conducted in 13 rehabilitation centers for somatic disorders as a prospective multicenter study with a randomized treatment–control group design. We compared abstinence rates after hospital discharge from treatment that included a group smoking cessation program with (treatment group) and without telephone booster sessions (control group). Data from 290 smokers were analyzed. After 6 and 12 months the treatment group achieved abstinence rates twice as high as those of the control group. Men profited more from telephone booster sessions than did women. Results indicated that telephone booster sessions were highly effective (even) after an inherently intensive group program during a hospital stay. Further research should focus on the special needs of women receiving telephone counseling.

Introduction

Smokers with smoking-related diseases (stroke, coronary heart disease, cancer, pulmonary diseases) who are hospitalized in rehabilitation centers should be offered smoking cessation. Continuation of smoking is a well-documented major factor in the occurrence of many negative health consequences, such as second primary tumors (Richardson et al., 1993) or further strokes and myocardial infarcts (Lightwood & Glantz, 1997). In contrast, successful smoking cessation leads to positive effects on health and longevity. For example, smoking cessation after myocardial infarction has been associated with a 50% reduction in mortality (Anthonisen et al., 2005) and a 36% reduction in the risk of all-cause mortality among patients with coronary heart disease (Critchley & Capewell, 2004). In addition, strong evidence indicates that smoking cessation interventions influence the long-term survival of people with chronic obstructive pulmonary disease (Anthonisen et al., 2005).

Hospitalization may present the right opportunity to offer interventions because "individuals may be more open to help at a time of perceived vulnerability, and may find it easier to quit in an environment where smoking is restricted or prohibited" (Rigotti, Munafò, Murphy, & Stead, 2004). Even so, smokers who stay in rehabilitation centers because of smoking-related diseases, and who are still smoking even though they have already experienced health consequences of smoking, may be highly resistant to changing their smoking behavior. For these smokers, high-intensity smoking cessation interventions might be indicated.

The U.S. Public Health Service clinical practice guideline "Treating tobacco use and dependence" gives clear advice for intensive interventions based on a number of meta-analyses (Fiore et al., 2000). Based on evidence of a strong dose–response relationship, an intervention can be called "intensive" if it consists of four or more sessions each lasting longer than 10 min with a total contact time of more than 30 min. The program format may be individual or group counseling. The intervention should involve practical counseling (problem solving and skills training) and social

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support, and every smoker should be encouraged to use pharmacotherapies. In addition, proactive telephone counseling has been shown to be effective.

One of the major challenges of smoking cessation during inpatient treatment is the high relapse rate after patients' discharge. Depending on the type of treatment, between 20% and 75% of smokers quit within a program. Among smokers who quit initially, up to 80% may relapse within a year (Centers for Disease Control and Prevention, 1993). Proactive telephone booster sessions may be an opportunity to help prevent relapse (or plan another quit attempt) by one or more of several mechanisms: by prolonging the time of treatment contact, by teaching coping skills, or by offering additional social support to the smoker trying to quit (Brandon, Collins, Juliano, & Lazev, 2000).

Three major reviews have been published about the effects of telephone counseling in smoking cessation. Lichtenstein, Glasgow, Lando, Ossip-Klein, and Boles (1996) described in their meta-analytic review the results of 13 randomized studies focusing on telephone counseling for smoking cessation. Three of these studies focused on the effects of telephone counseling after hospital-initiated smoking cessation and found significant effects compared with usual care. "None of these studies has isolated the role of telephone counseling per se, although it appears to have been the primary element …" (Lichtenstein et al., 1996, p. 249). Smoking cessation treatment in the three studies was mainly brief physician advice or a single behavioral counseling session plus self-help materials, nicotine replacement therapy, or both. In none of the studies were intensive group interventions offered during the hospital stay.

Rigotti et al. (2004) focused on inpatient smoking cessation interventions categorized by level of treatment intensity. The authors selected for their Cochrane review 17 studies, 13 of which included information about smoking cessation during the hospital stay plus follow-up support (mostly by telephone) after inpatient treatment. The evaluated smoking cessation interventions, both during the hospital stay and after discharge, varied greatly in intensity and number of postdischarge contacts. The authors concluded that only the most intensive interventions, namely inpatient contact plus follow-up for at least 1 month, were associated with a significantly higher quit rate compared with control conditions or usual care. An important consideration is that the inpatient contact in the reviewed studies barely reached the intensity recommended by the clinical practice guideline (Fiore et al., 2000). The combination of in-hospital counseling, self-help materials, and telephone booster sessions can be referred to as intensive treatment, but the in-hospital interventions alone cannot.

In another Cochrane review, Stead, Lancaster, and Perera (2004) evaluated the effect of proactive and reactive telephone support to help smokers quit. After reviewing 27 controlled studies, the authors concluded that telephone counseling increased quit rates (OR=1.54, CI=1.38–1.77), compared with less intensive interventions. Generally, successful interventions involved multiple contacts timed around a quit attempt. The authors concluded that telephone counseling as a primary intervention was successful. The benefit of telephone counseling as an adjunct to face-to-face counseling (or pharmacology) was neither confirmed nor ruled out by the available evidence. The authors' conclusion was based on only four studies, and, again, the included interventions varied greatly in intensity. Only one study used a multisession cessation program but not in an inpatient setting.

In summary, evidence indicates that telephone counseling as the primary intervention is an effective smoking cessation strategy and that short advice during an inpatient setting plus telephone counseling for at least 1 month after discharge is more effective than advice alone. But evidence is lacking concerning the additional effect of telephone booster sessions after intensive inpatient treatment. Therefore, the present study evaluated the effectiveness of telephone counseling as an adjunct to an intensive inpatient smoking cessation intervention, compared with an intensive inpatient intervention alone. We hypothesized that, compared with the control group, patients participating in telephone booster sessions would have higher abstinence rates 3, 6, and 12 months after discharge.

Method

Procedure

Germany has an extended rehabilitation system that differs in structure and contents from most other rehabilitation systems worldwide. Extensive inpatient rehabilitation services are provided. The system is financed not by health insurance but by the regional pension insurance institutes, BfA (federal pension insurance agency for salaried employees), and LVAs (state insurance agencies for workers). Rehabilitation and recovery of occupational functioning, so that patients can regain their ability to work, are the primary goals.

Patients are admitted either because they have overcome an acute ailment (e.g., stroke, coronary heart disease, cancer, pulmonary diseases) or because a chronic disorder (e.g., diabetes) has worsened to a degree that has made rehabilitation necessary. Rehabilitation starts after the acute situation has been cleared, for example, after intensive-care treatment and diagnosis of the ailment, and lasts about 3 weeks.

Rehabilitation consists of treatments aimed at reintegrating patients and preventing illnesses from becoming chronic. Patients admitted to rehabilitation centers expect to receive treatment, invigorating measures, but also instructions for future health-related behavior. Rehabilitation centers generally use an approach that combines specialized rehabilitative treatment measures with complementary general health approaches. Admission to these treatments represents a window of opportunity for medically necessary smoking cessation intervention. A large number of disorders treated in these hospitals are possibly caused by or related to nicotine consumption (e.g., cardiovascular disease, cancer, pulmonary disease, diabetes).

For the project described here, rehabilitation centers were recruited by cooperating with the BfA. A total of 27 rehabilitation centers were contacted through the BfA and informed about the project and participation conditions. Another 51 centers listed in a registry of rehabilitation centers in Germany that treat smoking-related diseases were contacted by mail directly through the research institute. Rehabilitation centers that were interested in participating received detailed information about the project. Participation was on a voluntary basis. Inclusion criteria for hospitals were (a) main diagnoses in one of the following areas: respiratory diseases, cardiovascular diseases, cancer, or diabetes mellitus, and (b) minimum length of stay of 3 weeks. A total of 14 hospitals agreed to participate and signed a cooperation contract. One hospital dropped out before data collection started because of internal organizational problems. Most participating centers focus on more than one somatic disorder: 61.5% of the hospitals treat different kinds of cancer, 46.2% treat cardiovascular diseases, 23.1% treat respiratory diseases, and 23.1% treat diabetes.

Each rehabilitation center assigned one or two therapeutic staff member(s) as smoking cessation specialist(s). Altogether 18 therapists were appointed by hospitals. They participated in a 3-day training workshop conducted by a team of professionals on smoking cessation and received highly structured manuals for the interventions to optimize standardization of the programs. The workshop included state-of-the-art information about smoking cessation and an introduction to the smoking cessation manuals, including role playing and video feedback. During the project, therapists collected participants' telephone numbers and sent this information to the research institute. Two specially trained female psychologists conducted five telephone booster sessions with each participant. These proactive telephone calls started shortly after hospital discharge and ended at a maximum of 10 weeks later. The telephone contacts lasted 10 min on average. Contacts were standardized by a guideline.

Data collection

During an information session, participants were given details about the study and signed an informed consent. All data where collected anonymously through code numbers participants gave themselves.

During the hospital stay, data from patients participating in the smoking cessation intervention were collected using standardized questionnaires and instruments before (T0) and at the end of treatment (T1). Questionnaires were administered, explained, and collected by therapists. The follow-up data assessments at 3 (T2), 6 (T3), and 12 months (T4) were conducted on the telephone by research staff. All data were based on self-reported information.

Design and setting

The study was conducted as a prospective multicenter study with a quasi-experimental treatment–control group design. During the hospital stay, smokers received one of two different group treatments, either a cognitive-behavioral (CBT) or a motivational treatment (MT). To control carryover effects, the two interventions were implemented in two phases: one half of the hospitals started with the CBT, the other half with the MT. Within a given time frame the hospitals switched to the other treatment condition. Hospitals were randomly assigned to start with one treatment condition. Smokers were assigned to the treatment being offered at that time. The two treatments did not differ in abstinence rates after 3, 6, and 12 months. For more detailed information, see Metz, Kröger, Schulz, and Heppekausen (2004) and Kröger, Metz, Bühler, and Heppekausen (2004).

Both interventions lasted seven sessions at 60 min each and can be called "intensive interventions" according to the clinical practice guideline (Fiore et al., 2000). After discharge, all participants were randomly assigned either to the control group, not receiving further treatment, or to the treatment group, receiving additional proactive telephone booster sessions. Because of limited (financial and personal) resources, given that the evaluation of telephone counseling was a subordinate research question in this project, only one-third of the sample was assigned to further treatment. The remaining two-thirds formed the control group.

Participants

The sample at baseline consisted of 307 identified smokers in rehabilitation centers. All subjects met the

criterion of smoking at least one cigarette during the past month. *ICD*-10 diagnoses assessed through the therapeutic staff of the hospitals included cardiovascular diseases (28.3% of subjects), diseases of the pulmonary system (23.5%), cancer (11.9%), gastrointestinal diseases (11.6%), and diabetes (9.2%). In addition, 5.8% of subjects had a comorbidity of diabetes and a cardiovascular disease. Data were missing for 9.6% of patients. Patients either were recruited to the smoking cessation intervention by physicians or other therapeutic staff at admission or they participated on a voluntary basis. A total of 116 smokers were assigned to the additional telephone counseling condition after discharge. The 17 patients who could not be reached were excluded from further analyses. Therefore, 191 patients did not receive telephone booster sessions; 99 smokers received the additional telephone calls after discharge. Not all subjects could be reached five times (related to moving, vacation, or refusal). A total of 14 received only one call, 5 received two calls, 7 received three calls, 9 received four calls, and 62 received all five calls. All patients who received at least one telephone booster call were assigned to the treatment group.

Among participants, 41.4% were female and 22.8% were married or cohabiting; 71.3% worked full or part time, 6.6% were retired, 18.7% were unemployed, and 1.7% reported being a housewife. Participants' mean age was 47.1 years (SD=10.34). Participants' average score on the Fagerström Test for Nicotine Dependence (FTND; Heatherton, Kozlowski, Frecker, & Fagerström, 1991) was 3.6 (SD=2.20). Participants smoked an average of 15.7 cigarettes per day (SD=10.73) during the past 30 days. Regarding stage of change (see below), 12.5% were in the precontemplation stage, 54.6% were contemplators, 17.9% were in the preparation stage (planning to quit smoking during the next 30 days), and 15% reported being nonsmokers already (action stage).

Inpatient group interventions

During the hospital stay, smokers were randomly assigned to a group intervention of either conventional CBT (n=135) or a newly developed MT (n=172) based on motivational interviewing (Miller & Rollnick, 2002). Group size varied between 3 and 10 patients. For a detailed description of the group interventions, see Metz (2005).

Telephone counseling

The first two of five calls were planned to take place during the 1st week after dismissal, the third contact during the 3rd week, the fourth call during the 5th week, and the fifth contact between the 6th and 10th weeks after dismissal.

The telephone counseling intervention was standardized by a guideline based on the algorithm of DiClemente et al. (1991). Smokers were classified into five stages (precontemplation, contemplation, preparation, action, and maintenance), referring to their intentions regarding quitting smoking (Figure 1).

Depending on participants' stage of change and their relapse experience, after the group intervention the telephone counseling differed in content:

- *Precontemplation*: acceptance of decision; involvement in the topic of smoking; giving individualized information; asking for knowledge, attitudes, fears, and advantages and disadvantages of smoking
- *Contemplation:* showing empathy, communicating optimism for abstinence trial, changing barriers into solutions, listing advantages and disadvantages (decisional balance), defining subordinate targets, emphasizing the advantages of abstinence
- *Preparation:* support for finding the optimal strategy for reaching abstinence, planning a quit day, developing alternatives, anticipating relapse situations
- *Precontemplation after relapse:* commending participants for the quit trial, exploring abstinence duration, showing empathy, reviewing the relapse, estimating competence to quit, improving skills
- *Contemplation after relapse:* commending participants for the quit trial, exploring abstinence duration, showing empathy, reviewing the relapse, decisional balance
- *Preparation after relapse:* commending participants for the quit trial, exploring abstinence duration, reviewing the relapse, anticipating risk situations, developing alternative strategies, planning another quit day
- *Action:* verbally reinforcing and commending participants for tobacco abstinence, anticipating possible relapse situations, discussing possible lapses, collecting positive aspects of tobacco abstinence

The guideline defined each stage, described the aims, and highlighted the stage-specific interventions with examples.

Measurement

The baseline questionnaire gathered sociodemographic data (age, gender, employment, and education) and smoking-related variables such as number of cigarettes smoked each of the past 30 days, onset of smoking, and tobacco dependence assessed with the FTND. Variables associated with successful quitting, such as depression, motivation, and self-efficacy, were measured with the following instruments: Depression was assessed with the Beck Depression Inventory (BDI; Hautzinger, Bailer,

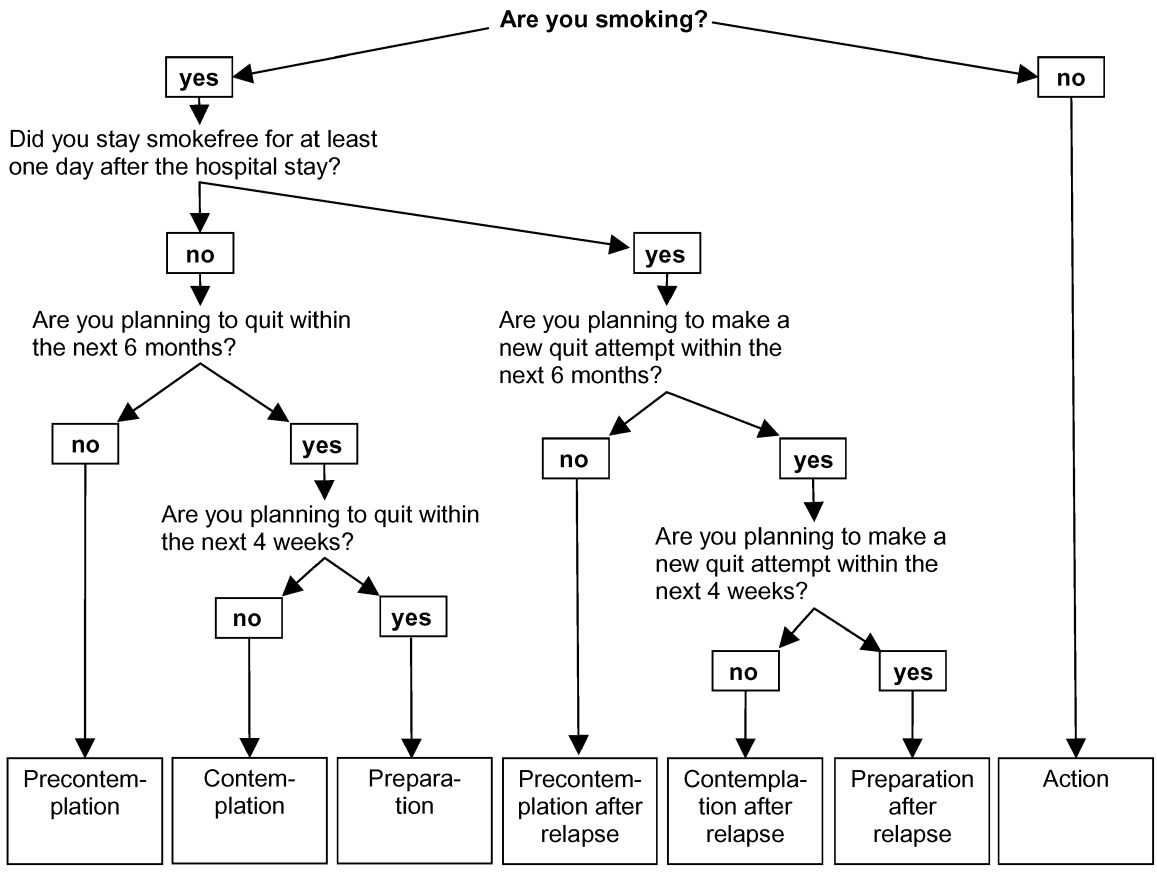

Figure 1. Telephone counseling intervention.

Worall, & Keller, 1991). Self-efficacy was assessed with the Self-efficacy Questionnaire for smokers (SE-R; Velicer, DiClemente, Rossi, & Prochaska, 1990). A second measurement of self-efficacy, a single item called the Confidence Rating (Sciamanna, Hoch, Duke, Fogle, & Ford, 2000), was used: "How confident are you about successfully quitting in the next month?" (four responses: 1=very confident; 2=somewhat confident; 3=not that confident; 4=not confident at all).

Motivation was measured with the stages-of-change algorithm (DiClemente et al., 1991) and with a single item called the Want Rating (Sciamanna et al., 2000): "How much do you want to quit smoking?" (four responses: 1=very much; 2=somewhat; 3=not that much; 4=not at all).

Dependent variable (tobacco abstinence)

Successful abstinence was achieved when patients reported no smoking for at least the past 7 days. No biochemical validation was undertaken.

Data analyses

Baseline characteristics were compared between the control and treatment groups using two-sample *t*-tests for continuous variables and chi-square tests for discrete variables. Binary logistic regression was used to compare the abstinence rates between the treatment groups (CBT and MT) at the end of intervention, at 3, 6, and 12 months of follow-up. Multivariate analyses were performed using a model that, in addition to telephone treatment condition (with vs. without telephone counseling), included as covariates the independent variables tobacco dependence, gender, and kind of intervention (CBT vs. MT) during inpatient setting. Analyses were conducted twice, once including the dropouts as smokers (intent-to-treat [ITT] analyses) and once using a subgroup for which data were available at each follow-up assessment. The results presented below specify significance values, odds ratios, and confidence intervals. In all cases, two tailed *p*-values smaller than .05 were considered statistically significant.

Results

Dropout analyses

Out of the 290 smokers included in the study, no data were available for 9.7% at the end of inpatient treatment (T1), for 32.4% at 3 months (T2), and for

35.2% at 6 months (T3); 32.8% participants could not be reached for follow-up assessment at 12 months (T4). Figure 2 represents the attrition and retention rates for all assessment times separately for both treatment conditions. For all assessment times, the rates of retention were significantly higher for the treatment group (T1: 96.7%; T2: 84.8%; T3: 72.7%; T4: 82.8%) than for the control group (T1: 86.9%; T2: 58.6%; T3: 60.7%; T4: 59.2%); T1 $\chi^2(1)=7.56$, $p<.01$; T2 $\chi^2(1)=20.45$, $p<.001$; T3: $\chi^2(1)=4.11$, $p<.05$; T4: $\chi^2(1)=16.58$, $p<.001$.

At the 12-month follow-up, dropouts from the control ($n=78$) and treatment ($n=17$) groups did not differ with regard to gender, age, or tobacco-related or other psychological characteristics. Because of the small sample sizes, these results have to be interpreted with care.

To examine the selectiveness of our attrition sample, we tested whether dropouts at the 12-month follow-up ($n=95$) differed from the reached sample ($n=195$). No significant differences between dropouts and the retention group could be detected with regard to gender, age, or tobacco-related or other psychological characteristics.

Pretest equivalence

The treatment group comprised 99 smokers (34.1%); the control group comprised 191 smokers (65.9%). A series of *t*-tests and chi-square tests showed no significant differences between groups in terms of gender or age at baseline, nor were there differences between conditions in terms of amount of cigarettes smoked, motivation, self-efficacy, depression, or tobacco abstinence at pretest (Table 1). Participants in the control group had significantly higher tobacco dependence (FTND score=3.8) than patients in the treatment condition (FTND score=3.1), $t(282)=2.60$, $p<.05$.

Abstinence rates

Figure 3 shows the results of the ITT analyses. The abstinence rate in the control group decreased from the end of hospitalization (26.3%) to 3 months (18.8%). Between 3 months and 12 months, the abstinence rates showed small variation, at around 17%. For the treatment group, the abstinence rate increased from the end of hospitalization (26.7%) to 3 months (41.4%); at 6 months it decreased to 30.3%. This high level of abstinence was stabilized at the 12 months. At 3 months, the abstinence rate of the treatment group was three times higher than that of the control group ($p=.000$, $\beta=1.109$, $OR=3.031$, $CI=1.731–5.305$). After 6 months and 12 months, the treatment group achieved an abstinence rate twice as high as that of the control group (6 months: $p=.035$, $\beta=.639$, $OR=1.895$, $CI=1.046–3.433$; 12 months:

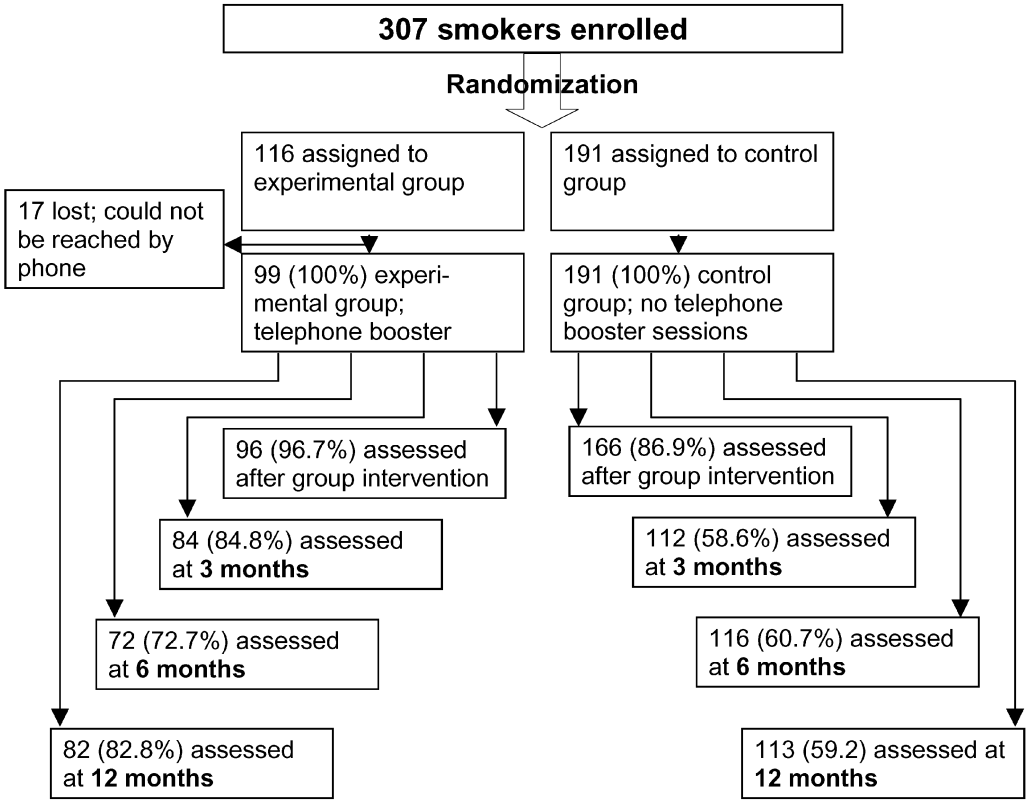

Figure 2. Dropout analysis.

Table 1. Pretest equivalence.

Variable	Control group (n=191)	Treatment group (n=99)	p value
Age, years	47.1	47.2	*ns*
Sex, percent female	38.2	47.5	*ns*
Dependence	3.8	3.1	<.05
Cigarettes/day	16.3	14.5	*ns*
Motivation (want rating 1–4; 1=not at all)	3.6	3.6	*ns*
Motivation (stages of change), percent			*ns*
Precontemplation	10.3	16.7	
Contemplation	56.5	51.0	
Preparation	17.4	18.8	
Action	15.7	13.5	
Depression (BDI range=0–43)	10.1	10.8	*ns*
Self-efficacy (SE-R range=9–45)	25.7	26.5	*ns*
Abstinent at pretest, percent	9.5	8.1	*ns*

Note. BDI, Beck Depression Inventory; *ns*, not significant; SE-R, Self-Efficacy Questionnaire for smokers.

p=.009, β=.780, OR=2.181, CI=1.212–3.926). Logistic regression analyses showed a statistically significant difference between the treatment conditions for all follow-up assessments, when controlling for gender, nicotine dependence, and kind of intervention during the hospital stay.

Because of the dropout bias between treatment and control conditions, we analyzed a subsample of 137 smokers (control group n=79; treatment group n=58) who had been assessed at each follow-up (Figure 4). From pre- to post-test, both conditions showed nearly the same abstinence rates (control group=38%; treatment group=34.5%). At the 3-, 6-, and 12-month follow-ups, participants who received telephone booster sessions had higher abstinence rates (3 months=51.7%; 6 months=48.3%; 12 months=43.1%) than patients who did not receive additional telephone counseling (3 months=31.6%; 6 months=30.4%; 12 months=29.1%). The control group abstinence rates decreased from T1 to T2 and stabilized between the 3- and 12-month follow-ups, whereas the treatment group rates increased after the telephone booster sessions and then decreased over time. After 12 months, abstinence rates were still higher in the treatment group than in the control group. Logistic regression analyses showed a statistical significance between the groups for the 3-month follow-up, when controlling for gender, nicotine dependence, and kind of intervention during the hospital stay (p=.027, OR=2.311,

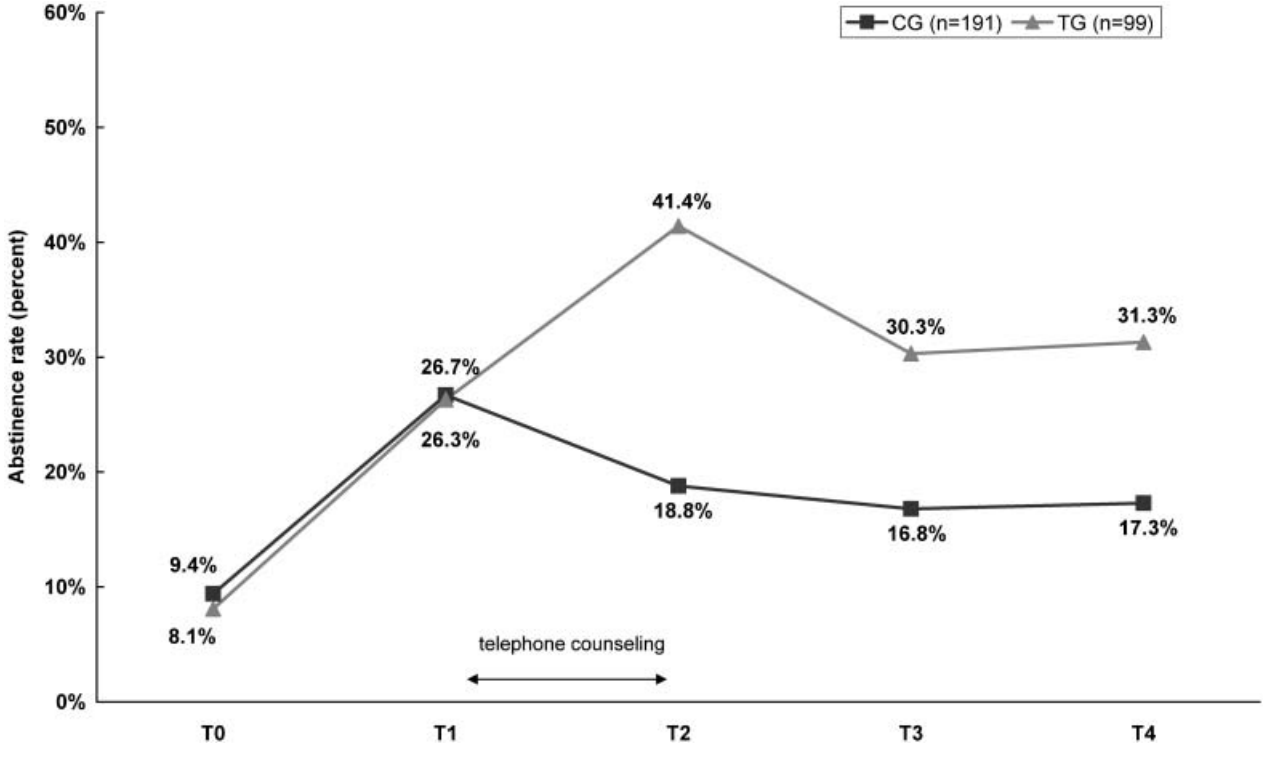

Figure 3. Abstinence rates of control group (CG) and treatment group (TG), ITT analysis. T0=before inpatient treatment began; T1=end of hospital stay; T2=3-month follow-up; T3=6-month follow-up; T4=12-month follow-up.

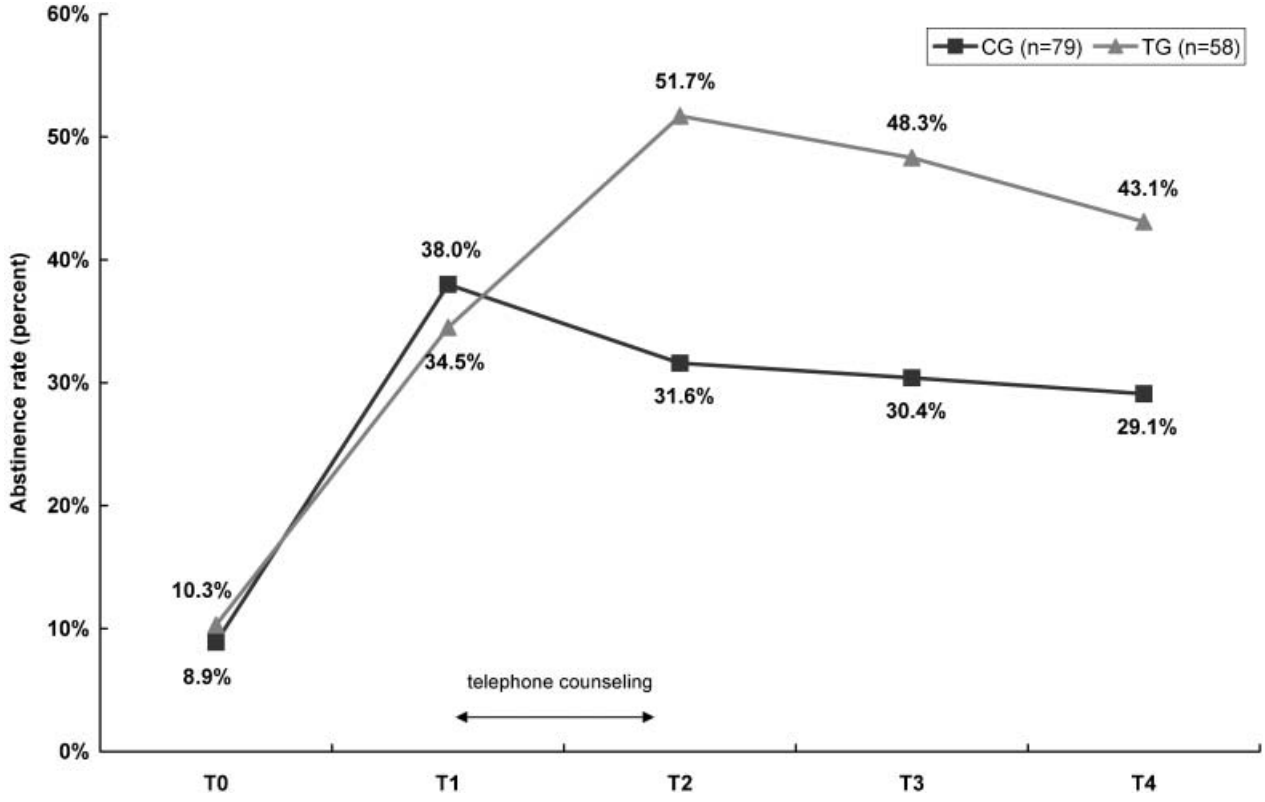

Figure 4. Abstinence rates of control group (CG) and treatment group (TG), subsample: assessment at each follow-up. T0=before inpatient treatment began; T1=end of hospital stay; T2=3-month follow-up; T3=6-month follow-up; T4=12-month follow-up.

CI=1.100–4.855). Differences at the 6-month (p=.079, *OR*=1.943, *CI*=.925–4.079) and 12-month follow-ups (p=.118, *OR*=1.828, *CI* .859–3.890) did not reach statistical significance.

Gender effects

In terms of the covariates, a gender main effect was noticed at the 12-month follow-up (ITT analysis: p=.026, *OR*=2.039, *CI*=1.089–3.820). Men were twice as likely as women to be abstinent.

Figure 5 shows the abstinence rates separately for men and women for the treatment group (left) and the control group (right). For the control group, the curves for men and women are similar. From T0 to T1, the abstinence rate increased. At 3 months after discharge from the hospital (T2), abstinence rates decreased. At T3 and T4, abstinence rates were maintained. No significant gender effect was found.

In the treatment group, the additional telephone counseling stabilized abstinence rates after inpatient treatment for women (T1: 23.4%; T2: 29.8%; T3: 23.4%; T4: 17.0%), whereas abstinence rates for men increased after telephone booster sessions (T1: 28.8%; T2: 51.9%; T3: 36.5%; T4: 44.2%). Significant differences were found after 3 months, $\chi^2(1)=4.99$, $p<.05$; and 12 months, $\chi^2(1)=8.50$, $p<.01$. Therefore, the gender main effect can be attributed to the differences in the treatment group.

Furthermore, we compared men and women before treatment started (T0), using the variables age, amount of cigarettes smoked per day, nicotine dependence, motivation, depression, and self-efficacy. Analyses found significantly higher depression scores for women (12.1 vs. 9.1, p=.007) and lower scores in self-efficacy (24.8 vs. 26.9, p=.040). By contrast, women smoked fewer cigarettes per day (14.1 vs. 16.7). No other variable reached statistical significance.

Discussion

The present study evaluated the effectiveness of telephone counseling in improving outcomes following participation in an intensive smoking cessation group program during inpatient treatment in rehabilitation centers for somatic disorders. This is the first study to evaluate proactive telephone counseling for smoking cessation after an intensive group program lasting more than four sessions.

The additional telephone counseling offered for a time period of 6 weeks after discharge from the rehabilitation center resulted in long-term abstinence rates (12-month follow-up) that were about two

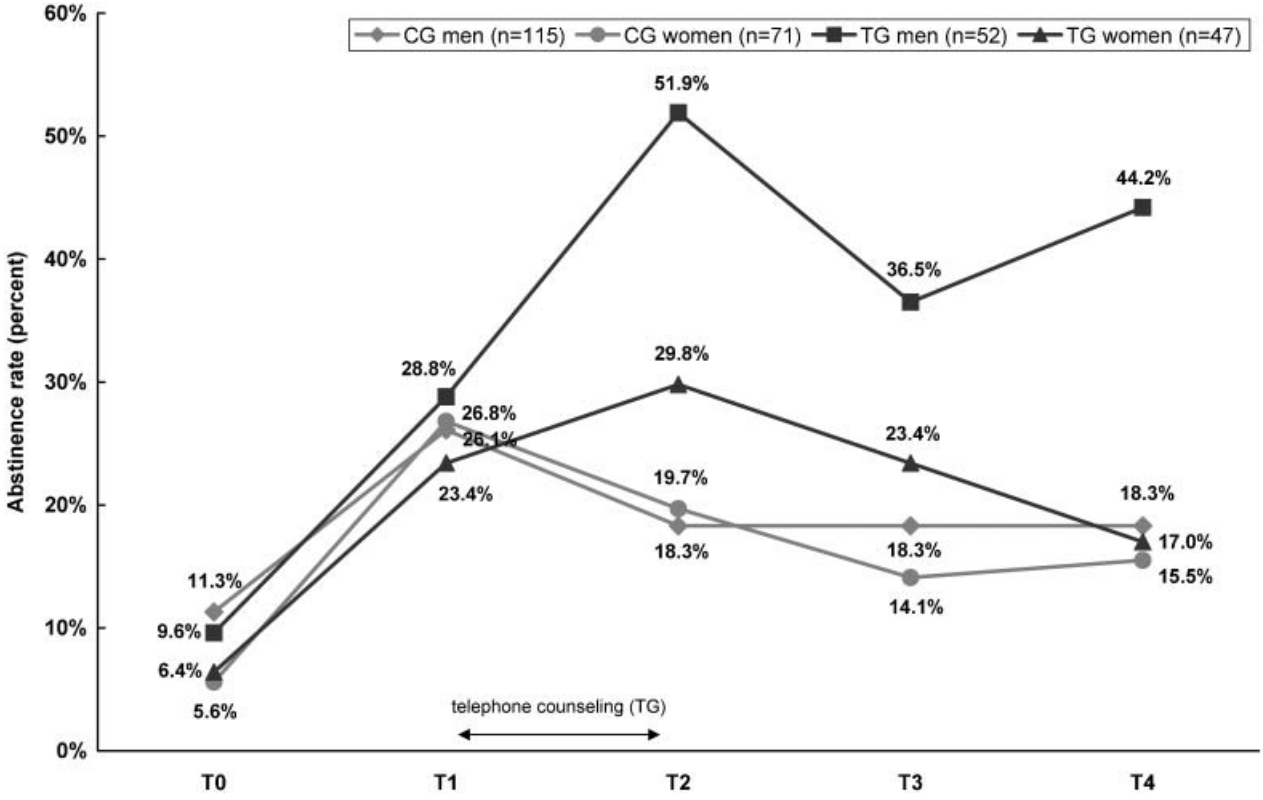

Figure 5. Abstinence rates in control and treatment groups, by gender. T0=before inpatient treatment began; T1=end of hospital stay; T2=3-month follow-up; T3=6-month follow-up; T4=12-month follow-up.

times higher than in smokers not receiving telephone counseling. This is the first time this effect has been examined and demonstrated for hospitalized patients in Germany. This effect confirms results of meta-analyses on the effect of telephone counseling. The detailed analyses and the observation of the effects over three assessment times (3, 6, and 12 months after end of hospital stay) showed that booster telephone sessions not only seemed to prevent relapse but also seemed to help continuing smokers to quit. Even after intensive group treatment, telephone booster sessions showed an additional long-term effect.

A dropout bias was detected in that patients in the treatment group had significantly lower dropout rates than did control group participants. This finding can be explained by the higher commitment of treatment group patients because of more personal contacts. Because of this bias, ITT analyses may have overestimated the effectiveness of telephone counseling. Therefore, we also analyzed a subsample of participants who could be assessed at each follow-up. This kind of analysis overestimates the overall abstinence rate, but the dropout bias can be controlled. Using this subsample, we found a statistically significant difference between conditions at the 3-month follow-up. After 6 and 12 months, the differences no longer reached statistical significance because of the smaller sample size and the insufficient statistical power. Nevertheless, the odds ratios indicated that the probability of being tobacco abstinent was 1.8 times higher in the treatment group than in the control group.

The present study was not without limitations. First, self-reported tobacco abstinence was not validated biochemically as is claimed to be the common standard (West, Hajek, Stead, & Stapleton, 2005). Biochemical validation was not feasible because of the multicenter design, which included patients from all over Germany. The self-reported data may have overestimated the cessation rate in the whole sample. On the one hand, it could be argued that the study's explanatory power is not curbed by this lack of biochemical validation, given that there was no indication that participants in one treatment condition would give less valid information than participants in the other (i.e., no systematic bias was expected). On the other hand, the treatment group received a significantly greater number of personal contacts and, thus, may have been more inclined to falsely report abstinence because of demand effects. We tried to minimize this effect by having different staff conduct the telephone booster sessions and the follow-up assessments.

Second, we have limited ability to generalize these results to settings other than the participating rehabilitation centers. The centers that participated did so on a voluntary basis and may belong to a

group of hospitals highly motivated and experienced in offering smoking cessation interventions, which may lead to better results. However, some centers participated that had no prior experience with smoking cessation and expected support by participating in a research project. Nevertheless, this issue should be analyzed systematically in future studies. Third, the study had a high dropout rate (32.8% at the 12-month follow-up), and reasons for study dropout were not assessed.

A secondary study result was a gender main effect: After 12 months, abstinence rates were two times higher in men than in women. This often-found effect, that women are less successful in smoking cessation than men (Fiore et al., 2000), remains the subject of controversy. Some studies underscore this gender effect (Wetter et al., 1999) and others reject it (Killen, Fortmann, Varady, & Kraemer, 2002). Women may have less success because they have a higher vulnerability to stress and are more likely than men to use cigarettes as a coping behavior for stress reduction. In the present sample, women were more depressed and less self-efficient, both characteristics that are negative predictors for tobacco abstinence (Anda et al., 1990; Gulliver, Hughes, Solomon, & Dey, 1995; Niaura et al., 2001; Ockene et al., 2000). Further analyses of our data should take a closer look at differences between women in both intervention conditions and should examine the question of whether these differences are associated with tobacco abstinence.

Our gender results should be interpreted carefully, because they were detected only by chance. More studies should be designed specifically to analyze gender effects and telephone counseling. A major argument for the controversy about gender effects in smoking cessation is that most studies use only post-hoc subgroup analyses to detect gender effects, which can be misleading (Yusuf, Wittes, Probstfield, & Tyroler, 1991). To examine gender effects in a methodologically sound manner, a priori hypotheses, greater power of studies, and randomization stratified by gender are needed (Killen et al., 2002). The gender of counselors also should be controlled for in future studies. In the present study, only women carried out the telephone counseling. Whether therapist gender has an influence on the effectiveness of telephone counseling in smoking cessation would be an interesting topic for future research.

Men tend to profit more from additional telephone counseling than women. A similar result was found by Mittag & China (2005), who showed for cardiac patients that only men profited from telephone booster sessions after cardiac rehabilitation. In contrast, Boyle et al. (2005) found that women profited more from telephone counseling than men, but this effect was significant only for women who smoked more than one pack per day. Thus, consensus is lacking with regard to the effectiveness of telephone counseling in women. This topic warrants exploration in future prospective studies.

Mermelstein, Hedeker, and Wong (2003) described a gender interaction effect when evaluating the relative effect of two different proactive telephone counseling conditions following participation in a smoking cessation group program. In the Mermelstein et al. (2003) study, men profited more from an enhanced condition, tailored to the stages of change, whereas women did better in the basic condition, consisting primarily of support. After exclusion of other possible explanations, the authors stated, ''We are thus left with one possible explanation that, for women, provision of general support, encouragement, and reinforcement alone may be an effective relapse prevention and recycling intervention, following a more structured group intervention … For men, however, … the tailored, individualized, structured goal-setting approach of the enhanced condition boosted success rates ….'' Thus, in the present study, we may have used an intervention that did not meet the special needs of women as much as it satisfied the needs of men.

In conclusion, results of the present study indicated that telephone booster sessions were highly effective (even) after an intensive group program during a hospital stay. Telephone counseling seemed to help prevent relapse in all patients and to help initiate quitting specifically in men. Future research should focus on the special needs of women receiving telephone counseling.

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