

Multicomponent individualized smoking cessation intervention for patients with lung disease

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Submitted for publication 1 August 2003

Accepted for publication 12 March 2004

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JONSDOTTIR H., JONSDOTTIR R., GEIRSDOTTIR T., SVEINSDOTTIR K.S. & SIGURDARDOTTIR T. (2004) *Journal of Advanced Nursing* 48(6), 594–604
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Aims. This paper reports a study examining the process and outcomes of a long-term, multicomponent smoking cessation intervention for patients with lung disease initiated while hospitalized and provided over 1-year postdischarge.

Background. Successful smoking cessation interventions are of primary importance for people with lung disease. Initiation of such an intervention in hospital settings is particularly important as patients may be especially motivated to quit as a result of strong perceptions of vulnerability while hospitalized for a smoking-related disease. Tailoring the intervention to each person's needs is a promising approach to practice.

Methods. All patients who smoked and were admitted to a pulmonary unit over 2 years were invited to participate in this quasi-experimental study ($n = 85$), and 69 continued beyond the first month. The intervention was shaped by the Trans-Theoretical Model and used nicotine replacement therapy, along with individual and group counselling and support grounded in the nurse–patient relationship. The intervention was provided during hospitalization and by telephone after discharge at 1 week, and 1, 3, 6 and 12 months.

Results. At 12-months postdischarge, 39% of the patients reported continuous abstinence from smoking from the time they joined the programme and 52% were not smoking at that time. No relationship was found between abstinence and the number of quit attempts, readiness to quit, nicotine dependency and length of hospital stay. Readiness to quit had increased and nicotine dependency decreased significantly by the end of the programme. No gender differences were found for the main variables.

Conclusions. Comprehensive, individualized smoking cessation interventions for hospitalized patients having lung disease, with a 1-year follow-up, was successful. Abstinence was high in comparison with other studies. This may in part be explained by significantly enhanced motivation to quit during the smoking cessation programme.

Keywords: smoking cessation, lung disease, quasi-experiment, nurse–patient relationship, nursing intervention, hospital

Introduction

A comprehensive smoking cessation intervention is the single most important clinical intervention for people with chronic obstructive pulmonary disease (COPD) (Anthonisen *et al.* 1994, Pauwels 2000, Scanlon *et al.* 2000, Pride 2001).

Smoking cessation is associated with a modest improvement in lung function, followed by a reduced rate of decline in smokers with mild-to-moderate COPD (Anthonisen *et al.* 1994, Scanlon *et al.* 2000). Symptoms such as cough, sputum, wheeze and shortness of breath also decrease significantly when smoking has been brought to a halt (Kanner *et al.* 1999). The effects of quitting smoking for people with advanced COPD are less well documented (Pride 2001), but indications exist that heavy smokers and those with the most damaged lung function benefit most (Scanlon *et al.* 2000). For heavy smokers, quitting smoking also lowers the risk of hospitalization caused by COPD (Godtfredsen *et al.* 2002).

Prominent approaches in smoking cessation interventions are pharmacological and behavioural, most often in combination. The majority of studies of smoking cessation interventions do not articulate the nature of the interaction, particularly the relationship that the care provider develops with the client. A major exception to this is studies grounded in the TransTheoretical Model (TTM) (Prochaska & DiClemente 1983, Prochaska *et al.* 1992, 1993, Prochaska *et al.* 2002).

Nurse-initiated smoking cessation interventions are increasing (O'Connell & Koerin 1999, Browning *et al.* 2000, Sarna & Lillington 2002), and nurse-designed studies have shown modest positive outcomes (Rice 1999, Jonsdottir & Jonsdottir 2001). This is important given the devastating effects of tobacco use and the benefits of quitting. Initiation of smoking cessation interventions in the hospital setting is of particular importance, as patients may be especially motivated to quit as a result of stronger perceptions of vulnerability while they are hospitalized for smoking-related diseases (Miller *et al.* 1997, France *et al.* 2001).

Everyone who smokes has the potential to benefit from smoking cessation intervention (Fiore *et al.* 2000). Therefore, all hospitalized patients who smoke should receive smoking cessation help. Multicomponent and long-term interventions provided by specialists are of particular significance. However, because of short hospital stays brief interventions (3 minutes or less) may be more feasible for the majority of patients. To maximize their effectiveness, more attention needs to be paid to the preparation, expertise and time allocation of staff who provide these interventions (West *et al.* 2000, West 2002).

This paper describes and measures abstinence of a long-term multicomponent smoking cessation intervention provided to people hospitalized for treatments of lung disease, followed by a 12-month postdischarge follow-up. The intervention was shaped by the TTM and tailored to each patient's motivation to quit. The change from being a smoker to becoming a non-smoker was considered a process of change, rather than two dichotomous states, and the nurse–patient relationship an important component in facilitating the change.

Literature review

Smoking cessation in hospital

Smoking cessation intervention is a necessary intervention for hospitalized smokers because of its effectiveness in improving health. Strong perceptions of vulnerability while hospitalized may also make patients particularly motivated to quit (Miller *et al.* 1997, France *et al.* 2001). Systematic reviews by Munafó *et al.* (2001) and France *et al.* (2001) show that smoking cessation interventions in hospital with long-term follow-up (minimum of 1 month) after discharge are effective. In France *et al.*'s (2001) review, nine of the 20 studies discussed provided intensive interventions (minimum one contact for more than 15 minutes) with long-term follow-up. All nine of these studies showed higher abstinence in treatment groups compared with controls, with six showing

statistically significant differences. Similarly, Munafó *et al.* (2001) showed statistically significant differences in seven of 15 inpatient studies with a range of contacts in hospital plus long-term follow-up.

Studies of smoking cessation for patients with lung disease are rare. Those reported in Table 1 show that, for hospitalized patients with lung disease, abstinence varied between 16% and 37% in experimental groups and 9% and 35% in control groups. For patients in outpatient clinics, abstinence prevalence was 3–35% in experimental groups and 1–20% in control groups. Differences between experimental and control groups were not statistically significant in most of these studies. However, comparison of results between studies needs to be carried out with caution as intervention designs and methodologies differ considerably.

TransTheoretical Model and smoking cessation

The TTM describes the stages and processes people move through when they change problematic behaviour, e.g. tobacco smoking, alcohol and substance abuse and eating disorders (Prochaska & DiClemente 1983, Prochaska *et al.* 1992, 1993, Prochaska *et al.* 2002). The model was developed from leading theories in psychotherapy and has been tested extensively. It refers equally to self-initiated and professionally facilitated processes of change. The five stages of the model are: (1) precontemplation – not intending to change, (2) contemplation – intending to change within 6 months, (3) preparation – actively planning to change, (4) action – overtly making changes and (5) maintenance – sustaining change and resisting relapse. The majority of people make on average three to four quit attempts before they succeed and if they relapse they usually move to contemplation or preparation stages. The largest numbers of people, or 50–60%, are in the precontemplation stage, 30–40% are in the contemplation stage, and the remaining 10–15% is prepared for action (Prochaska *et al.* 1992).

In addition to these five stages, 10 closely interrelated change processes are described. These are overt and covert activities and experiences that people engage in, with different intensity, when modifying problematic behaviour. Half of the change processes are behavioural. They are: (i) *helping relationships* referring to seeking and using social support, (ii) *counterconditioning* – substituting new behaviour and thinking for the smoking behaviour, (iii) *stimulus control* – removing reminders and cues to smoking and adding new ones which sustain abstinence, (iv) *self-liberation* – making a firm commitment to stay abstinent and

(v) *reinforcement management* – increasing rewards for being abstinent and decreasing those for smoking. The other half of the change processes are experiential and cognitive. They are: (i) *social liberation* – realizing that social norms are changing towards supporting abstinence, (ii) *consciousness-raising* – finding and learning what supports abstinence, (iii) *self-re-evaluation* – realizing that quitting smoking is an important part of one's personal identity, (iv) *dramatic relief* – experiencing the negative emotions that go along with smoking and (v) *environmental re-evaluation* – realizing the negative impact of smoking and positive impact of abstinence (Prochaska *et al.* 2002). Experiential and cognitive processes are used more frequently early in the change process and the behavioural ones peak in the action and maintenance stages (Prochaska *et al.* 1988, 1992, DiClemente *et al.* 1991). Abstinence rate is related to the stages participants are in – their readiness – when entering a smoking cessation programme, and indicates that different approaches are necessary in different stages (DiClemente *et al.* 1991, Prochaska *et al.* 1992).

The TTM suggests that quitting smoking is a process rather than two dichotomized states (DiClemente *et al.* 1991). This approach provides an expanded view on interacting with patients who smoke and draws attention to the nurse–patient relationship. A previous study showed that close relationships with patients with lung disease were one of two central components of quality care (Jonsdottir 1999). In relating to patients, the nurse is fully present with them, authentic, non-judgmental and concentrates on making sense of what is of importance in their life in relation to smoking and quitting (Newman 1986, 1997). The nurse engages in caring relationships with patients with the purpose of helping them to handle a complex and intricate health problem in a dignified manner, acknowledging the therapeutic effects of feeling being understood as a patient (Benner & Wrubel 1989). In doing so, smoking is considered in a broad context of life and living (Litchfield 1999) rather than just concentrating on it as a problematic behaviour.

Our previous study also showed that knowing patients was of central importance in quality nursing care (Jonsdottir 1999). Drawing on that study and work Tanner *et al.* (1993), 'knowing the patient' was conceptualized on one hand as knowing the patient as a person, including salient and contextualized information on the person's personality, values, preferences, prior experiences and the family situation. On the other hand it referred to knowing the patient's pattern of responses to therapeutic measures, their routines and habits, coping resources and physical and mental capacities and endurance.

Table 1 Smoking cessation interventions for patients with lung disease

Authors	Experimental design	Participants	Interventions	Results
<i>Hospitalized patients with lung disease</i>				
Tashkin <i>et al.</i> (2001)	Double blind, randomized, placebo-controlled	Country: USA Mild-to-moderate COPD Age 35 and older Exp: <i>n</i> = 204 Control: <i>n</i> = 200	Exp: Counselling, encouraging quitting smoking and preventing relapse, and Bupropion SR for 12 weeks with follow-up at 6 months Control: Same counselling and placebo for 12 weeks with follow-up at 6 months	Biochemically validated at 6 months Exp. group: 16% LFAT Control group: 9% LFAT (<i>P</i> = 0.04) Exp. group: 23% PP Control group: 16% PP (<i>P</i> = 0.07)
Miller <i>et al.</i> (1997)	Randomized	Country: USA Hospitalized patients (<i>n</i> = 1942) Subgroup of respiratory patients Exp. 1: <i>n</i> = 67/540 Exp. 2: <i>n</i> = 46/460 Control: <i>n</i> = 113/942	Exp. 1: Physician advice, nurse-mediated, behaviour-oriented counselling focused on relapse prevention with four postdischarge telephone contacts, information booklet, a relaxation audiotape, NRT for highly addicted and a written contract Exp. 2: Same as Exp. 1 except one postdischarge telephone contact Control: Usual care, consisting of physician advice, information booklet and a list of outpatient smoking cessation programmes	Biochemically validated at 1 year Exp. 1: 2.5% (17/67) Exp. 2: 37% (17/46) Control: 35% (40/113) ns
Pederson <i>et al.</i> (1991)	Randomized	Country: Canada COPD patients Mean age: 53.4 years 51 men, 23 women Exp. group: <i>n</i> = 37 Control group: <i>n</i> = 37	Exp: Advice to quit, counselling 2–8 sessions (<i>M</i> = 3), lasting 15–20 minutes, every other day while hosp. And a self-help smoking cessation manual Control: Advice to quit and not allowed to smoke at the unit	Self-reported at 6 months and a biochemical validation on a subsample Exp. group: 33.3% Control group: 21.4%, ns
<i>Lung patients in outpatient clinics</i>				
Anthonisen <i>et al.</i> (1994)	Double blind, placebo-controlled	Country: USA and Canada COPD mild-to-moderate Outpatient clinics <i>n</i> = 5887 Men: 63% Mean age: 48 years Exp. 1: <i>n</i> = 1961 Exp. 2: <i>n</i> = 1962 Control: <i>n</i> = 1964	Exp. 1*: Smoking intervention and bronchodilator. 12 group sessions combining behaviour modification and use of nicotine gum, with a continuing 5-year follow-up to prevent relapse Exp. 2: Same smoking intervention but instead of a bronchodilator, a placebo inhaler was used Control: Advice to stop smoking	Biochemically validated every 4th month for 5 years Exp. 1 and 2: 22% LFAT 5 years; 35% PP 5 years Control: 5% LFAT 5 years; 20% PP 5 years

Table 1 (Continued)

Authors	Experimental design	Participants	Interventions	Results
Tonnesen <i>et al.</i> (1996)	Randomized	Country: Denmark Outpatient clients Smoked < 10 cigarettes/day/ Smoked ≥10 cigarettes/day and refused trial with RCT Exp. <i>n</i> = 254 Control: <i>n</i> = 253 Mean age: 51 exp./53 controls Men: 50% exp./61% controls	Exp: Motivational minimal intervention: one time 5 minutes counselling, self-help manual and a letter at 4–6 weeks encouraging quitting Control: No intervention	Biochemically validated at 1 year Exp: 3.1% LFAT Control: 1.2% LFAT (<i>P</i> = 0.22) Exp: 8.7% PP Control: 3.6 %, PP (<i>P</i> = 0.025) Smoked <10 cigarettes/day: Exp: 13.9% PP Control: 6.3% PP (<i>P</i> = 0.12) Smoked ≥10 cigarettes/day Exp: 5.2% PP Control: 1.9% (<i>P</i> = 0.20)

COPD, chronic obstructive pulmonary disease; Exp, experimental; LFAT, lapse-free abstinence time; M, mean; PP, point prevalence abstinence; ns, not statistically significant.

*The difference between Exp. 1 and 2 was in the use of inhaler medications and did not influence the effects of the smoking cessation treatment. Exp. 1 and 2 are, therefore, considered identical for the purpose of this analysis.

The study

Aim

The aim of the study was to answer the following research questions.

- What is the prevalence of abstinence at 1, 3, 6 and 12 months postdischarge after participating in a multi-component smoking cessation intervention?
- Is there a gender difference in abstinence?
- Is there a relationship between stages of readiness during hospitalization and abstinence 12 months postdischarge?
- Is there a relationship between nicotine dependency during hospitalization and abstinence 12 months postdischarge?
- Is there a relationship between length of hospitalization and abstinence 12 months postdischarge?

Design

The research design was quasi-experimental. No control group or randomization was used. The decision not to have a control group was made in light of the seriousness of continued smoking for patients with lung disease. It was considered unethical not to provide all patients with the best possible smoking cessation intervention recommended and feasible, given the situation at the unit. Besides this, no comparable group of participants was available outside the unit as this is the only acute pulmonary unit in the country.

Participants

The participants were 85 acutely ill patients with lung disease who smoked and were admitted to the pulmonary unit at a university hospital in Iceland between January 2000 and December 2001. The majority had COPD or asthma. All received some smoking cessation help, regardless of their readiness to quit. Sixteen were lost to the study by the first month, and a total of 34 were lost by the end of the study (see Figure 1). Only one patient was unwilling to participate beyond the first interview, and seven died during the course of the study.

Measurements

Research data were taken from information recorded in each patient's nursing records and recorded in a standard format. Readiness to quit was assessed on an ordinal scale, according to the five stages of TTM (Stillman 1995, Plummer *et al.* 2001): precontemplation (1), contemplation

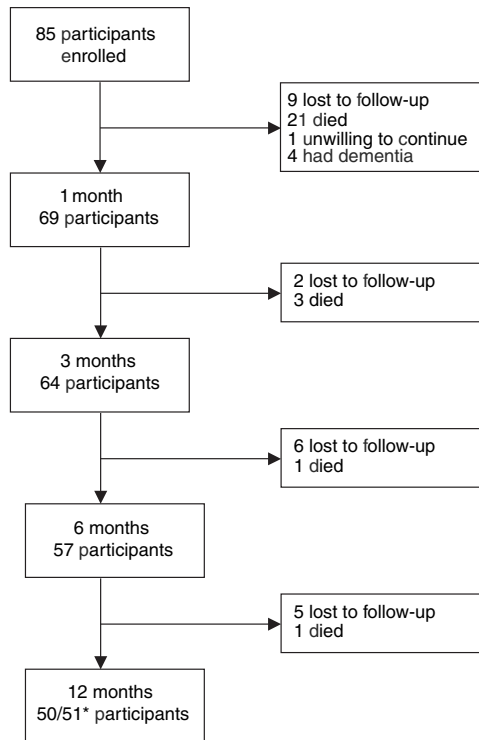


Figure 1 Profile of intervention. *The discrepancy in the final number of respondents is because of one more piece of missing data on for total abstinence for smoking (LFAT) than for point prevalence (PP).

(2), preparation (3), action (4) and maintenance (5). Nicotine dependency was assessed on an ordinal scale according to Fagerström test for nicotine dependence (FTND) (0–10), which has been found to be a valid measure of heaviness of smoking when weighted against a biochemical index (Heatherton *et al.* 1991, Pomerleau *et al.* 1994). The FTND has also been shown to be reliable (0.882, $P < 0.001$) and to have satisfactory internal consistency (Cronbach's $\alpha = 0.64$) (Pomerleau *et al.* (1994).

For a description of the participants (see Table 2). Of particular interest is the high percentage of women (63%) and the low mean nicotine dependency score (4.4).

Abstinence from smoking was measured as: (a) lapse-free abstinence time at 1 year postdischarge (LFAT), indicating that the participant reported that they had not smoked at all since starting the intervention and (b) point prevalence (PP), signifying that the person reported being smoking-free on the day of being contacted. Abstinence rate calculation at 1 week postdischarge was not included in this study because of its insignificance as an indicator of abstinence, despite its therapeutic significance at this point of time.

Both measurements were self-reported. Biological confirmation was not used, in part because of non-feasibility and in part as comparability has been found in studies using biological confirmation and self-reported abstinence (Fiore *et al.* 2000). Abstinence prevalence was calculated for all contacted persons each time. Patients lost to follow-up were not counted as smokers, as is frequently practiced in other work.

Intervention

This was an individualized, patient-centered intervention (Lauer *et al.* 2002) grounded in caring relationships with the patients and with an emphasis on knowing the patients (Jonsdottir 1999), shaped by the TTM and following key guidelines for smoking cessation interventions (Raw *et al.* 1998, Fiore *et al.* 2000, West *et al.* 2000), and building on prior experiences (Jonsdottir & Jonsdottir 2001). The intensity of the intervention was maximized by frequent and extensive personal contacts with each participant, emphasizing emotional and social support, problem-solving guidance, gaining social support outside the hospital, and encouraging combined and long-term nicotine replacement therapy (NRT). Relapse to smoking was considered a

Table 2 Characteristics of participants

	Participants <i>n</i> (%)	Age, M (SD)	Pack years, M (SD)	Current smoking, M (SD)	Attempts to quit, M (SD)	Readiness to quit, M (SD)	Nicotine dependency, M (SD)
Women	43 (62.8)	62.4 (13.5)	40.3 (15.2)	19.8 (11.3)	5.8 (6.8)	2.3 (0.7)	4.7 (2.1)
Men	26 (37.2)	66.1 (10.0)	57.2 (28.1)	17.4 (11.9)	4.0 (4.0)	2.4 (0.7)	4.0 (2.3)
Total	69 (100)	63.8 (12.3)	46.7 (22.5)	18.8 (11.5)	5.1 (5.9)	2.3 (0.7)	4.4 (2.2)

M, mean.

Pack years: refers to the total amount of tobacco smoking. Twenty cigarettes (a pack), or their equivalents, smoked regularly per day over a year equals one pack year.

Current smoking: number of cigarettes (or equivalent in other type of tobacco use) smoked per day.

Readiness to quit according to TTM (1–5).

Nicotine dependency according to FTND (0–10).

learning experience (Prochaska *et al.* 1992). Participants, along with family members, were invited to attend group meetings during and after hospitalization.

The team providing the intervention consisted of five nurses and the intervention consisted of seven components, as described below.

Individual counselling and support

Each patient received personal counselling and support, primarily from the same two nurses. The sessions were not prearranged, but were fitted into work schedules as appropriate. The number and length of sessions varied. The first was the most comprehensive, consisting of assessment, counselling, support and planning and lasted 30–60 minutes. Thereafter, the majority of participants received four to six 10–15 minutes sessions. Some received more and a few less, depending on the length of stay and identified needs.

Nicotine replacement therapy

The NRT was administered by the nurses who provided the counselling and support, depending on the nicotine dependency and smoking history of the person. Two forms of NRT were most frequently used. By doing this, different absorption qualities were used and patients' preferences recognized. Most often a patch was used, along with chewing gum, nasal spray or an inhaler. Tapering off the NRT was slow, acknowledging possible long-term benefits of NRT (Fiore *et al.* 2000). NRT was available to participants at no cost during hospitalization. After discharge they could buy it over-the-counter, except for the nicotine inhaler, for which a prescription was needed.

A variety of group meetings were held according to a preset time schedule which was announced at the unit. The degree to which patients participated in the meetings differed depending on the length of their hospital stay. While in hospital patients enthusiastically attended these meetings, but once discharged they did not, and this has been reported in other studies (France *et al.* 2001). Family members hardly participated at all.

Group support

The same three nurses (two each time) conducted a weekly support group for those who had already quit smoking, consisting of relaxation and sharing experiences of quitting.

Group teaching about lifestyles

The same two nurses conducted biweekly group meetings focusing on smoking cessation in relation to diet, exercise,

alcohol use and stress management, along with a strong emphasis on relapse prevention. Both smoking and non-smoking patients participated in the meetings.

Group teaching about smoking, nicotine and NRT

Physicians conducted a biweekly group teaching meeting focusing on smoking, nicotine and NRT, and this was open to both smoking and non-smoking participants.

Relaxation

Guided imagery, visualizing images of being a smoke-free person, was incorporated into relaxation sessions provided weekly for all patients at the unit.

Telephone follow-up

Postdischarge follow-up was provided at 1 week, and 1, 3, 6 and 12 months. The main intent was to be open to any concerns about smoking cessation, to prevent relapse, congratulate successes, advise on the use of NRT and facilitate further quit attempts in cases of relapse.

Ethical considerations

The study was approved by the hospital's bioethics committee, following approval by chief medical and nursing executives and department heads. No pharmaceutical company funded the study. Data collected in this study were a part of information gained for regular nursing practice with regard to the smoking cessation intervention. In Iceland, as in many other countries, it is assumed that hospitalized patients are aware that their records may be used for research purposes, and the law does not require them to be specifically informed about this or to sign a consent form.

Data analysis

Data are presented as percentages (number) or mean (\pm SD). A one-sample Kolmogorov–Smirnov Test showed that variables were not normally distributed. The paired Wilcoxon *Z*-test was used to test before and after differences in nicotine dependence and readiness to quit. The Mann–Whitney *U*-test was used to compare differences in nicotine dependence, readiness to quit and days of hospitalization at the onset of intervention between patients who were abstinent and non-abstinent by the end of the programme. Comparisons on the gender variable were made with chi-square calculations. A $P < 0.05$ (two-tailed) was regarded as indicating a statistically significant difference.

Results

Abstinence

Twelve months postdischarge, 39% patients had totally stayed away from smoking (measured by the LFAT) and 52% were not smoking at the time of being contacted (PP) (see Table 3). No gender differences were found in abstinence at 1, 3, 6 and 12 months (LFAT at 12 months $\chi^2 = 2.286$, d.f. = 1, $P < 0.131$, PP at 12 months $\chi^2 = 0.427$, d.f. = 1, $P < 0.514$).

Stages of readiness and abstinence

No relationship was found on readiness to quit at onset and abstinence at 1, 3, 6 and 12 months postdischarge (LFAT at 12 months: Mann–Whitney $U = 237.000$, $P < 0.231$, PP at 12 months: Mann–Whitney $U = 219.500$, $P < 0.127$). The mean readiness score at the beginning of the intervention was 2.33 ($n = 67$, $SD = 0.68$), which shows that participants were at the contemplation stage, indicating that majority intended to quit within 6 months. Data were compared using the measurements available on the same individuals at the beginning and end of the intervention, and showed a statistically significant move in the process of change (paired Wilcoxon test $Z = -3.527$, $P < 0.001$; see Table 4). This indicates that by the end of the programme participants had, on average, made active plans to quit smoking or had already quit. No gender differences were found.

Degree of nicotine dependency and abstinence

The mean score for nicotine dependency at hospitalization was 4.44 ($n = 64$, $SD = 2.19$). No relationship was found between level of nicotine dependency during hospitalization and abstinence 12 months (LFAT at 12 months Mann–Whitney $U = 204.500$, $P < 0.130$; PP at 12 months Mann–Whitney $U = 193.500$, $P < 0.078$). Nicotine dependency was compared based on the measurements available for the same participants

at the beginning and end of the intervention and showed a significant reduction (paired Wilcoxon test $Z = -3.431$, $P < 0.001$; see Table 4). No gender differences were found.

Length of hospitalization and abstinence

It was hypothesized that the longer patients stayed in hospital, having more intensity of smoking cessation help, the more likely they were to become abstinent. The mean length of hospitalization was 22.2 days ($SD = 20.2$, $n = 68$) and no relationship between this and abstinence at 12 months postdischarge was found (LFAT at 12 months Mann–Whitney $U = 273.000$, $P < 0.475$; PP at 12 months Mann–Whitney $U = 290.000$, $P < 0.669$).

Discussion

The results showed 39% self-reported continuous abstinence (LFAT) 12 months postdischarge and 52% of patients were not smoking (PP) by the end of the intervention. Abstinence at 12 months was higher than at both 3 and 6 months. This can be explained by different numbers used in calculating the ratio of smokers to non-smokers at each point of time, as well as increased readiness to quit during the period of the study.

Comparison between the studies described in Table 1 and our results is promising. In previous studies, the abstinence rate varied from 16% to 37% in experimental groups of hospitalized patients with lung disease and 3–35% in patients in outpatient clinics. However, caution is warranted because of different programme designs and methodologies. No relationship was found between nicotine dependency and length of hospital stay or abstinence. No gender difference was found for the main variables. Gender difference for abstinence has, however, been demonstrated in previous studies and it has most often been to the advantage of men, who quit more frequently than women (O'Connor *et al.* 1996).

No relationship was found between readiness to quit and number of quit attempts or abstinence. This is contrary to what

Table 3 Abstinence at 1, 3, 6 and 12 months

	1 month % ($n = 68$)	3 months % ($n = 64$)	6 months % ($n = 57$)	12 months % ($n = 50/51$)*
LFAT abstinence	48.5 (33)	35.9 (23)	35.1 (20)	39.2 (20)
PP abstinence	57.4 (39)	45.3 (29)	43.9 (25)	52.0 (26)

LFAT, lapse-free abstinence time, designating not having smoked at all since starting the treatment.

PP, point prevalence abstinence, indicating being free from smoking on the day of being questioned.

*The discrepancy in the final number of respondents is because of one more piece of missing data for total abstinence for smoking (LFAT) than for point prevalence (PP).

Table 4. Readiness to quit and nicotine dependency at beginning and end of treatment at 12 months

	<i>n</i>	Mean	SD	Median	Min/Max
Readiness to quit at beginning	25	2.32	0.69	2	1–4
Readiness to quit at 12 months	25	3.72	1.34	4	1–5
Nicotine dependency at beginning	20	3.85	2.03	3	1–8
Nicotine dependency at 12 months	20	1.05	1.9	0	0–6

Readiness to quit according to TTM (1–5).

Nicotine dependency according to FTND (0–10).

would be expected according to the TTM (DiClemente *et al.* 1991, Prochaska *et al.* 1992). However, there was a significant difference between readiness score and nicotine dependency score at the beginning and end of the intervention, which may in part explain the high abstinence level. Farkas *et al.* (1996) have demonstrated the inadequacy of readiness to quit measurements and the power of nicotine dependency measurements to predict abstinence. Regardless of this, both measurements are helpful indicators when selecting intervention components relevant to individual needs in line with the TTM and for determining the dosage of nicotine replacement medications.

Our results allude to the importance of considering quitting smoking as a process rather than an isolated event. This means that it is essential in the intervention to motivate those who are not yet ready to quit. Nurses relate to patients and by doing so they attend and respond to their contextual needs each time, which leads them to providing patients with support, information, guidance or whatever help each individual needs at any given point of time.

All patients admitted to the lung unit and who smoked were invited into the study. Being a smoker was the only criterion for participation. This inevitably increased the chances of people dropping out. Thirty-four of 85 patients were unavailable at the end of the study, of whom seven had died, four had dementia and one declined participation. Therefore, actual loss was 22 patients or 26%. Dropout needs to be considered in the light of the fact that participants were vulnerable, chronically ill patients. Motivation to quit also varied considerably among participants: the majority was not ready to quit at the outset, and this is different from most hospital-based studies, in which being motivated to quit is one of selection criteria into programmes (France *et al.* 2001).

At the outset participants had made about five attempts to quit smoking, but their readiness to quit score reflected the contemplation stage indicating that they were not ready to quit. These results are somewhat contradictory. They may

suggest that in earlier quitting attempts patients used means that were not helpful, i.e. the processes they used did not fit the stage of change at which they were (Prochaska *et al.* 1992). The results may also reflect how hard it is not to be able to give up smoking, particularly when one has a devastating lung disease, suggesting that participants might have forced themselves to quit smoking even when they were not ready to do so, and consequently relapsed.

In this study, the TTM was used in part as the theoretical underpinning for nurse–patient encounters. As in majority of studies based on the model it was not tested as such (Andersen & Keller 2002). We considered the TTM as one component of the theoretical underpinnings for the study, rather than the sole theoretical framework, because of the primacy of the nurse–patient relationship. Implementation of a fully predetermined intervention protocol was considered restricting nurses' options in responding to the uniqueness of each patient in the context of their life as a whole. The TTM underscores the importance of interacting with people in accordance with their motivation to quit smoking (Prochaska *et al.* 1992). Thus, these two approaches are consistent, but the TTM *prescribes* what nurses should do rather than nurses drawing from the model to illuminate their actions in response to what patients present as needs or problems each time.

The relationships that nurses establish with patients during the process of quitting smoking and how they contribute to abstinence are of particular interest. However, studying this process by means of randomized controlled trials is insufficient. Different research methods, particularly qualitative, are needed to illuminate the meaning of this process, for example, what is most helpful to patients when attempting to quit, what is most important for them in terms of smoking and not smoking, and what is people's general experience of quitting smoking.

The limitations of the study from the perspective of the experimental design were that participants were not randomized into experimental and control groups, 26% of participants dropped out during the course of the study and biological confirmation was not used. The reasons for this have been explained. However, the strengths of the study were that the intervention was designed as a part of nursing practice and is immediately applicable, the intervention was built on values inherent in nursing practice, particularly as regards the nurse–patient relationship, and quitting smoking was considered a process of change and a learning experience.

Conclusions

This study showed that comprehensive smoking cessation interventions for people with lung disease provided during

What is already known about this topic

- Comprehensive smoking cessation interventions are the single most important intervention available for people with chronic obstructive pulmonary disease.
- Intensive smoking cessation interventions for some groups of hospitalized patients with long-term follow-ups after discharge are effective.
- Studies of smoking cessation interventions particularly aimed at hospitalized patients with lung disease are rare.

What this paper adds

- A comprehensive individualized smoking cessation intervention for hospitalized patients with lung disease, followed by a 1-year follow-up, was successful.
- There was no relationship between the number of quit attempts, readiness to quit, nicotine dependence, length of stay and abstinence. No gender differences were found for abstinence.
- Smoking cessation interventions should be a part of regular nursing practice for hospitalized patients with lung disease.

hospitalization followed by a 1-year follow-up is effective. However, much is still to be learned about smoking cessation interventions for people with lung disease. The effectiveness of nicotine medications, along with professional support and guidance, needs to be studied further. The effectiveness of Bupropion SR has been demonstrated for COPD patients, but needs further examination, as does the effectiveness of NRT. Some studies based on the TTM exist, but further examination of the change process is needed.

To view relapse as an ordinary learning experience, rather than a failure, is a humane approach to practice. Recently, Dalton and Gottlieb (2003) examined the concept of readiness to change and found a number of factors that prompt changes, including perception that a health concern is not going to resolve, feeling better able to manage stress, having sufficient energy and perception of adequate support in undertaking change. Given the complex situations in which patients with lung disease frequently find themselves, these factors seem pertinent and would widen the context in which the quitting smoking experience could be explored in the future.

Nurses are increasingly recognizing their role in establishing effective smoking cessation interventions for people who smoke. Our results should further encourage nurses to institute smoking cessation interventions into daily service

in healthcare institutions. Provision of smoking cessation interventions should not be limited to hospitalized patients, although there are indications that the hospital may be a particularly useful setting to do so. A diversity of community-based smoking cessation interventions is absolutely necessary as well.

Acknowledgements

We would like to extend our gratitude to Edda Steingrimsdottir, RN, for participating in some of the group meetings and telephone follow-ups, Margret Hakonardottir, RN, for leading the relaxation sessions, the physicians who provided the group sessions about smoking, nicotine and NRT, and Alda Gunnarsdottir, RN, head nurse, for her support and encouragement throughout this work. We would like to thank the Icelandic Nurses Association, National University Hospital and Institute of Nursing Research at the University of Iceland for their financial and material support for this project.

References

- Andersen S. & Keller C. (2002) Examination of the transtheoretical model in current smokers. *Western Journal of Nursing Research* 24(3), 282–294.
- Anthonisen N.R., Connett J.E., Kiley J.P., Altose M.D., Bailey W.C., Buist A.S., Conway W.A., Enright P.L., Kanner R.E., O'Hara P., Owens G.R., Scanlon P.D., Tashkin D.P. & Wise R.A., for the Lung Health Study Research Group (1994) Effects of smoking intervention and the use of an inhaled anticholinergic bronchodilator on the rate of decline of FEV₁. *Journal of the American Medical Association* 27(19), 1497–1505.
- Benner P. & Wrubel J. (1989) *The Primacy of Caring. Stress and Coping in Health and Illness*. Addison-Wesley, California.
- Browning K.K., Ahijevych K.L., Ross P. & Wewers M.E. (2000) Implementing the agency for health care policy and research's smoking cessation guideline in a lung cancer surgery clinic. *Oncology Nursing Forum* 27(8), 1248–1254.
- Dalton C.C. & Gottlieb L.N. (2003) The concept of readiness to change. *Journal of Advanced Nursing* 42(2), 108–117.
- DiClemente C.C., Prochaska J.O., Fairhurst S.K., Velicer W.F., Velasquez M.M. & Rossi J.S. (1991) The process of smoking cessation: an analysis of precontemplation, contemplation, and preparation stages of change. *Journal of Consulting and Clinical Psychology* 59(2), 295–304.
- Farkas A.J., Pierce J.P., Zhu, S-H., Rosbrook B., Gilpin, E.A., Berry, C. & Kaplan, R.M. (1996) Addiction versus stages of change models in predicting smoking cessation. *Addiction* 91(9), 1271–1280.
- Fiore M.C., Bailey W.C., Cohen S.J., Dorfman S.F., Goldstein M.G., Gritz E.R., Heyman R.B., Jaén C.R., Kottke T.E., Lando H.A., Mecklenburg R.E., Mullen P.D., Nett L.M., Robinson L., Stitzer M.L., Tommasello A.C., Villejo L. & Wewers M.E.

- (2000) *Treating Tobacco Use and Dependence. Clinical Practice Guideline*. Department of Health and Human Services. Public Health Service, Rockville, Maryland.
- France E.K., Glasgow R.E. & Marcus A.C. (2001) Smoking cessation intervention among hospitalized patients: what have we learned? *Preventive Medicine* 32, 376–388.
- Godtfredsen N.S., Vestbo J., Osler M. & Prescott E. (2002) Risk of hospital admission for COPD following smoking cessation and reduction: a Danish population study. *Thorax* 57(11), 967–972.
- Heatherton T.F., Kozlowski L.T., Frecker R.C. & Fagerström K.-O. (1991) The Fagerström test for nicotine dependence: a revision of the Fagerström Tolerance Questionnaire. *British Journal of Addiction* 86 1119–1127.
- Jonsdottir H. (1999) Outcomes of implementing primary nursing in the care of people with chronic lung diseases: the nurse experience. *Journal of Nursing Management* 7, 235–242.
- Jonsdottir D. & Jonsdottir H. (2001) Does physical exercise in addition to a multicomponent smoking cessation program increase abstinence rate and suppress weight gain? An intervention study. *Scandinavian Journal of the Caring Sciences* 15, 275–282.
- Kanner R.E., Connet J.E., Williams D.E. & Buist A.S. *et al.*, for the Lung Health Study Research Group (1999) Effects of randomized assignment to a smoking cessation intervention and changes in smoking habits on respiratory symptoms in smokers with early chronic obstructive pulmonary disease: the lung health study. *American Journal of Medicine* 106, 410–416.
- Lauer D.R., Ward S.E., Heidrich S.M., Keller M.L., Bowers B.J., Brennan P.F., Kirchhoff, K.T. & Wells, T.J. (2002) Patient-centered interventions. *Research in Nursing & Health*, 25, 246–255.
- Litchfield M. (1999) Practice wisdom. *Advances in Nursing Science* 22(2), 62–73.
- Miller N.H., Smith P.M., Debusk R.F., Sobel D.S. & Taylor B.C. (1997) Smoking cessation in hospitalized patients. Results of a randomized trial. *Archives of Internal Medicine* 157(24), 409–415.
- Munafó M., Rigotti N., Lancaster T., Stead L. & Murphy M. (2001) Interventions for smoking cessation in hospitalised patients: a systematic review. *Thorax* 56, 656–663.
- Newman M.A. (1986) *Health as Expanding Consciousness*. Mosby Comp, St Louis, MO.
- Newman M.A. (1997) Evolution of the theory of health as expanding consciousness. *Nursing Science Quarterly* 10(1), 22–25.
- O'Connell K.A. & Koerin C.A. (1999) Smoking cessation assistance. In *Nursing Interventions. Effective Nursing Treatments*, 3rd edn (Bulechek G.M. & McCloskey J.C., eds), W.B. Saunders Co., Philadelphia, PA, pp. 438–450.
- O'Connor E.A., Carbonari J.P., & DiClemente C.C. (1996) Gender and smoking cessation: a factor structure comparison of processes of change. *Journal of Consulting and Clinical Psychology* 64(1), 130–138.
- Pauwels R.A. (2000) National and international guidelines for COPD: the need for evidence. *Chest* 117(Suppl.), 20S–22S.
- Pederson L.L., Wanklin J.M. & Lefcoe N.M. (1991) The effects of counseling on smoking cessation among patients hospitalized with chronic obstructive pulmonary disease: a randomized clinical trial. *The International Journal of the Addictions* 26(1), 107–119.
- Plummer B.A., Velicer W.F., Redding C.A., Prochaska J.O., Rossi J.S., Pallonen U.E. & Meier K.S. (2001) Stages of change, decisional balance, and temptations for smoking. Measurement and validation in a large, school-based population of adolescents. *Addictive Behaviors* 26, 551–571.
- Pomerleau, C.S., Carton, S.M., Lutzke, M.L., Flessland, K.A. & Pomerleau, O.F. (1994) Reliability of the Fagerström Tolerance Questionnaire and the Fagerström Test for Nicotine Dependence. *Addictive Behaviors* 19(1), 33–39.
- Pride N.B. (2001) Smoking cessation: effects on symptoms, spirometry and future trends in COPD. *Thorax* 56(Suppl. II), ii7–ii10.
- Prochaska J.O. & DiClemente C.C. (1983) Stages and processes of self-change of smoking: toward an integrative model of change. *Journal of Consulting and Clinical Psychology* 51(3), 390–395.
- Prochaska J.O., Velicer W.F., DiClemente C.C. & Fava J. (1988) Measuring processes of change: application to the cessation of smoking. *Journal of Clinical and Consulting Psychology* 56(4), 520–528.
- Prochaska J.O., DiClemente C.C. & Norcross J.C. (1992) In search of how people change. Applications to addictive behaviors. *American Psychologist* 47(9), 1102–1114.
- Prochaska J.O., DiClemente C.C., Velicer W.F. & Rossi J.S. (1993) Standardized, individualized, interactive and personalized self-help programs for smoking cessation. *Health Psychology* 5, 399–405.
- Prochaska J.O., Redding C.A. & Evers, K.E. (2002) The Transtheoretical Model and stages of change. In *Health Behavior and Health Education. Theory, Research, and Practice*, 3rd edn (Glanz K., Rimer B.K. & Lewis F.M., eds), Jossey-Bass, New York, pp. 99–120.
- Raw M., McNeill A. & West R. (1998) Smoking cessation guidelines for health professionals. *Thorax* 53(Suppl. 5, part 1), 1S–19S.
- Rice V.H. (1999) Nursing intervention and smoking cessation: a meta-analysis. *Heart & Lung* 28(6), 438–454.
- Sarna L. & Lillington L. (2002) Tobacco. An emerging topic in nursing research. *Nursing Research* 51(4), 245–253.
- Scanlon P.D., Connett J.E., Waller L.A., Altose M.D., Bailey W.C., Buist A.S. & Tashkin D.P. (2000) Smoking cessation and lung function in mild-to-moderate chronic obstructive pulmonary disease. *American Journal of Respiratory and Critical Care Medicine* 161, 381–390.
- Stillman F.A. (1995) Smoking cessation for the hospitalized cardiac patient: rationale for and report of a model program. *Journal of Cardiovascular Nursing* 9(2), 25–36.
- Tanner C.A., Benner P., Chesla C. & Gordon D.R. (1993) The phenomenology of knowing the patient. *Image: Journal of Nursing Scholarship* 25(4), 273–280.
- Tashkin D.P., Kanner R., Bailey S. Buist S. Anderson P., Nides M.A., Pedersen L., Gonzales D., Dozier G., Patel M.K. & Jameson B.D. (2001) Smoking cessation in patients with chronic obstructive pulmonary disease: a double-blind, placebo-controlled, randomized trial. *Lancet* 357, 1571–1575.
- Tønnesen P., Mikkelsen K., Markholst C., Ibsen A., Bendixen M., Pedersen L., Fuursted R., Hansen L.H., Stensgaard H., Schiøtz R., Petersen T., Breman L., Clementsen P. & Ewald T. (1996) Nurse-conducted smoking cessation with minimal intervention in a lung clinic: a randomized controlled study. *European Respiratory Journal* 9, 2351–2355.
- West R. (2002) Helping patients in hospital to quit smoking. (Editorial). *British Medical Journal* 324, 64.
- West R., McNeill A. & Raw M. (2000) Smoking cessation guidelines for health professional: an update. *Thorax* 55, 987–999.