

Paper V

Title: Is fear arousal message feasible in helping cardiac patients to stop smoking.

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Is fear arousal message feasible in helping cardiac patients to stop smoking?

Abstract

Objective

To assess the feasibility of a smoking cessation program based on a fear arousal message in patients with coronary heart disease.

Methods

Data were obtained from a randomised controlled trial of smoking cessation intervention (the intervention group) compared to usual care (the control group) in 240 smokers admitted for coronary heart disease. The intervention focused on fear arousal and relapse prevention, and was delivered by cardiac nurses without special training. Patient satisfaction was assessed at 12 months follow up.

Results

Compared to the control group, participants in the intervention group stated that the hospital had helped them significantly more in quitting smoking, and that they were significantly more satisfied with the help they had got from the hospital in quitting smoking. Both quitters and sustained smokers had a significantly higher level of satisfaction in the intervention group compared to the control group.

Conclusion

A smoking cessation program based on fear arousal message is feasible.

Practice Implications

Smoking cessation programs based on simple intervention principles can safely and effectively be delivered by untrained nurses. Such programs should be more applicable in ordinary clinical settings than programs using a psychologically based approach with especially trained personnel.

Keywords: Smoking cessation, coronary heart disease, randomised controlled trial, fear arousal message.

1. Introduction

Quitting smoking is the most effective single action to reduce mortality after a coronary event, and is associated with an approximately 50% relative mortality reduction after five years compared to sustained smoking [1,2]. Despite this, only 30-40% stop smoking spontaneously [3]. Individualised smoking cessation interventions with several months of follow up have been shown to increase the cessation rates to about 60% [4-7]. Two of these investigations used rather complicated psychologically based approaches like the social learning theory combined with addiction models [4], and the transtheoretical model [5]. These models may be both difficult and expensive to implement in an ordinary clinical setting. Further, they may not be necessary because over 80% of patients admitted for coronary heart disease stop smoking during hospitalisation. Hence, smoking cessation programs in these patients only need to focus on relapse prevention. Many years of research on communicating messages arousing fear shows that such messages are effective when they are accompanied by education on how to reduce the health threat [8]. The two other studies used simple intervention principles focusing on a fear arousal message, and had similar efficacy regarding cessation rates [6,7]. However, the use of fear arousal message is controversial, and has been criticised because it may provoke defensive responses and emotions such as denial of personal risk, hostility, anger and anxiety [9-11]. From a randomised controlled trial [7], we tried to assess the feasibility of implementing a fear arousal message in a smoking cessation program in patients with coronary heart disease.

2. Methods

2.1 The intervention

Patients who were daily smokers, motivated to quit smoking, under 76 years of age and admitted for acute myocardial infarction (n=176), unstable angina (n=36) or recent coronary bypass (n=28), were included in the trial from February 1999 to September 2001. After providing written informed consent, the patients were randomly allocated to usual care (control group) or intervention. The intervention was a smoking cessation program initiated in the hospital and delivered by cardiac nurses. It was based on a booklet especially produced for the study, and focused on fear arousal and prevention of relapse. The booklet emphasised the health benefits of quitting smoking after a coronary event. Two illustrations showed the differences in mortality between those who continued smoking after myocardial infarction or unstable angina and those who stopped. One was a bar chart showing a 60% risk reduction for death after five years of quitting (figure 1) [12], and the other was a linear chart showing that after 13 years 18% of patients who continued smoking were alive compared with 63% of those who had quit (figure 1) [13]. On the basis of these figures, the participants were told that if they continued smoking they most probably would suffer another heart attack, that their risk of death would be markedly increased, and that they most probably would not reach a high level of age (fear arousal message). The booklet also contained information on how to prevent relapse, such as how to identify and cope with high risk situations for relapse, and how to use nicotine replacements. The patients were contacted regularly, mostly by phone, for at least five months after discharge. The control group received usual care which included firm and unequivocal advice to stop smoking, but no further instructions on how to stop smoking. Details regarding recruitment methods and the intervention program have been explained elsewhere [7].

2.2 Outcome measures

At 12 months follow up, those who claimed to be quitters and had a nicotine metabolite concentration in urine below a cut-off value consistent with abstinence, were classified as non-smokers. At one year follow up patients who stated they were still smoking, and those who had a nicotine metabolite concentration in urine above a cut-off value consistent with smoking, were classified as sustained smokers and those who claimed they had quit and had a low nicotine metabolite concentration, were classified as quitters [7].

The patient satisfaction was assessed at 12 months follow up. The participants were asked to answer questions on the degree the hospital had informed them about the tobaccos effects on their heart, on the degree they felt they were helped by the hospital in quitting smoking, and on the satisfaction of this help (table 1). The preprinted alternatives for answering were ranging from very low degree/very little satisfied (1) to very high degree/very much satisfied (5).

2.3 Statistical analysis

After confirmation by the Lilliefors' test that the continuous variables (i.e. the patient satisfaction scores) had no obviously skewed distribution, the differences in means between the randomised groups were assessed with the independent samples t-test.

Regarding the evaluation of differences in means (i.e. the patient satisfaction scores) between non-randomised groups (i.e. quitters versus sustained smokers),

multivariate linear regression analyses were applied, in order to be able to adjust for differences in baseline characteristics.

All tests were two-tailed, with significance level (alpha) of 0,05 and confidence interval of 95%. We used SPSS for Windows (version 12.0) for all analyses.

3. Results

Two hundred and forty patients were assigned either the intervention (n=118) or usual care group (n=122; control group). At 12 months follow up, 218 participants were available, giving a total drop out rate of 9%. Thirty-seven percent (44/118) in the control group and 57% (57/100) in the intervention group had stopped smoking at 12 months follow up. Further details regarding the flow of patients through trial, patient characteristics, and smoking cessation rates have been published previously [7].

Nearly all patients answered all the questions (table 2). Compared to the control group, participants in the intervention group stated they had got significantly more information on the tobacco's effect on their heart, that the hospital had helped them significantly more in quitting smoking, and that they were significantly more satisfied with the help they had got from the hospital in quitting smoking (table 2). The participants in the intervention group had a mean score of 4.1 compared to 2.9 in the control group. These differences were not due to increased cessation rates in the intervention group, as both sustained smokers and quitters scored significantly higher in the intervention group compared to the control group on all the three questions.

The abstainers were slightly more satisfied with the help they had got from the hospital in quitting smoking than the sustained smokers at 12 months follow up, with a mean score of 3.7 (SD 1.2) and 3.1 (SD 1.2), respectively. This difference remained significant after adjustment for treatment allocation, with a significance value of 0.02 in a multiple linear regression analysis. Regarding the degree of

information about the tobacco's effects on the heart and the degree of help from the hospital in quitting smoking, there were no significant differences among the quitters versus the sustained smokers.

4. Discussion and conclusion

4.1 Discussion

We have shown that patients are very satisfied with a smoking cessation program based on a fear arousal message. Our results are strengthened by the assessment of the fear arousal message within a randomised controlled trial. We could thereby demonstrate that patients given a fear arousal message were significantly more satisfied than patients given usual care.

Due to the following reasons, it can be debated whether the investigation specifically measured the participants' feelings regarding the fear arousal message: First, the patient satisfaction was recorded 12 months after the introduction of the fear arousal message, at which point the anger and hostility, if previously present, might have been forgotten. Second, we did not ask the participants specifically how they evaluated the fear arousal message. Other elements in the program may have outweighed the negative feelings around the fear arousal message. Third, the delivery of the message was probably important. The study nurses tried to give the message with empathy, and in a positive way (i.e. if you manage to give up smoking, your risk of suffering another heart attack will be cut down to the half compared with continued smoking.). Hence, some of the patients may not have recognised that they actually received a fear arousal message.

To our knowledge, there are no previous investigations evaluating the feasibility of a fear arousal message in helping patients with heart diseases to stop smoking. Further, it is unknown whether this is an important element in a cessation program. It is possible that mechanisms other than fear arousal, such as positive feedback and a long follow up period, were at play in generating the positive results in our study. Burt et. al. told patients suffering a heart attack that that continued smoking could lead to further heart attacks because it would narrow the arteries in a manner similar to furring in a pipe, sometimes with complete blockage [6]. This

cessation program was also effective, but again, other elements in the program may have been equally important. Still, some evidence exist indicating that the arousal of fear by warning about risks can be successfully incorporated with other patient education techniques to change patients' health behaviour [14].

Using fear tactics with cardiac patients are not among the standard recommendations for effective smoking cessation [15], and have been criticised [9-11]. But some may feel that it is our duty as health personnel to inform about the health hazards of continued smoking. Otherwise, the patients do not receive the appropriate information to base their decision about quitting or not. However, participants who do not give up smoking may experience anxiety at first and if they subsequently cannot quit, depression [11]. In our study, even the sustained smokers had a high level of satisfaction with the cessation program (a mean score of 4.0 compared to 2.6 among sustained smokers in the control group), and the Quality of Life among the sustained smokers in the intervention group were not inferior compared to sustained smokers in the control group [16]. These findings indicate that major anxiety, hostility or depression did not occur due to the fear arousal message.

Anxiety and fear have been shown to induce arrhythmias in animal studies [17], but to our knowledge there are no indications neither from our study nor others that a fear arousal message cause arrhythmias in cardiac patients. It is probably important that a fear arousal message is accompanied by further handling strategies and support [8]. The study nurses, and the booklet used in the program, thoroughly explained how to stop smoking, and how to prevent relapse. The patients also had several months of follow up, mostly by telephone. These elements may explain why the fear arousal message was accepted and well tolerated.

4.2 Conclusion

We conclude that a smoking cessation program based on a fear arousal message and several months of follow up is both effective and feasible, with a high level of patient satisfaction, and without any indications of unwarranted effects.

4.3 Practice implication

A smoking cessation program with simple intervention principles (fear arousal, positive feedback, and several months of follow up) can safely and effectively be delivered by untrained personnel. Similar programs may be more applicable in an ordinary clinical setting than the more complicated psychologically based approaches.

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References

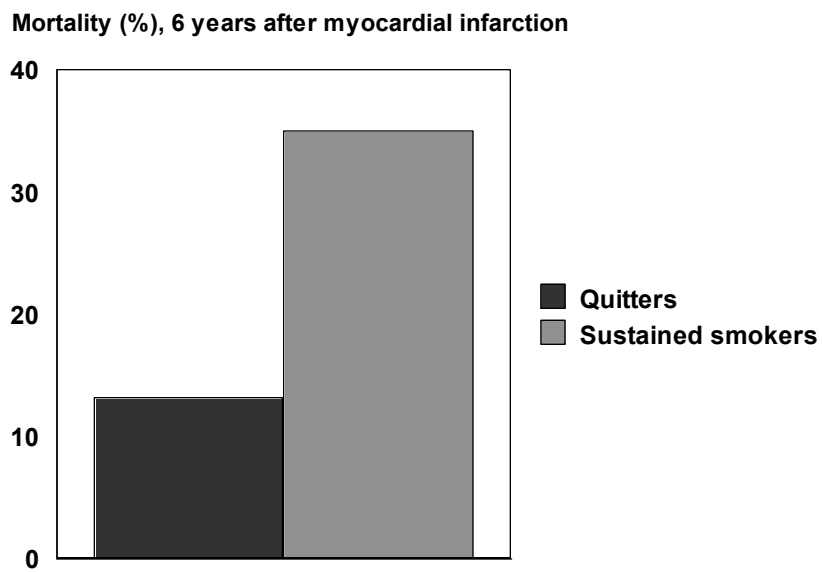
- [1] Wilson K, Gibson N, Willan A, Cook D. Effect of smoking cessation on mortality after myocardial infarction: meta-analysis of cohort studies. *Arch Intern Med* 2000;160:939-44.
- [2] Critchley JA, Capewell MD. Mortality risk reduction associated with smoking cessation in patients with coronary heart disease. *JAMA* 2003; 290(1): 86-97.
- [3] Rigotti NA, Singer DE, Mulley AG Jr, Thibault GE. Smoking cessation following admission to a coronary care unit. *J Gen Intern Med* 1991;6:305-11.
- [4] Taylor CB, Houston-Miller N, Killen JD, DeBusk RF. Smoking cessation after acute myocardial infarction: effects of a nurse-managed intervention. *Ann Intern Med* 1990;113:118-23.
- [5] Dornelas EA, Sampson RA, Gray JF, Waters D, Thompson PD. A randomized controlled trial of smoking cessation counselling after myocardial infarction. *Prev Med* 2000;30:261-8.
- [6] Burt A, Thornley P, Illingworth D, White P, Shaw TR, Turner R. Stopping smoking after myocardial infarction. *Lancet* 1974;1:304-6.
- [7] Quist-Paulsen P, Gallefoss F. Randomised controlled trial of smoking cessation intervention after admission for coronary heart disease. *BMJ*. 2003; 327: 1254-7.
- [8] Witte K, Allen M. A Meta-analysis of fear appeals: Implications for effective public health campaigns. *Health Educ Behavior* 2000; 25: 591-615.
- [9] Marteau M, Hall S. EU's anti-smoking stance needs to be more than frightening. *BMJ* 2001;323:635.
- [10] Fonteyn M E. A nurse led smoking cessation intervention increased cessation rates after hospital admission for coronary heart disease. *Evidence-Based Nursing* 2004; 7:46.
- [11] Bundy C. Fear is arrhythmogenic. *bmj.com*, 3 Dec 2003.
- [12] Daly LE, Mulcahy R, Graham IM, Hickey N. Long term effect on mortality of stopping smoking after unstable angina and myocardial infarction. *BMJ* 1983;287:324-6.
- [13] Sparrow D, Dawber TR. The influence of cigarette smoking on prognosis after a first myocardial infarction. A report from the Framingham study. *Journal of Chronic Diseases* 1978;31:425-32.

- [14] O'Connor GT, Gaylor MS, Nelson EC. Helath counseling: two strategies. *Physician Assist* 1985; 9:39-40, 44-8, 52.
- [15] Reimer W S, de Swart E, de Bacquer D, Pyørælae K, Keil U, Heidirch J, *et. al.* Smoking behaviour in European patients with established coronary heart disease. *Eur Heart J* 2006;27:35-41.
- [16] Quist-Paulsen P, Bakke PS, Gallefoss F. Does smoking cessation improve Quality of Life in patients with coronary heart disease? *Scandinavian Cardiovascular Journal* 2006; 40: 11-16.
- [17] Verrier RL, Lown B. Biobehavioural stress and cardiac arrhythmias. *Annu Rev Physiol* 1984; 46:155.

Figure 1

These charts, showing a vast mortality reduction in quitters compared to sustained smokers after myocardial infarction or unstable angina [12, 13], were printed in the self help material.

On the basis of these charts, a fear arousal message was delivered



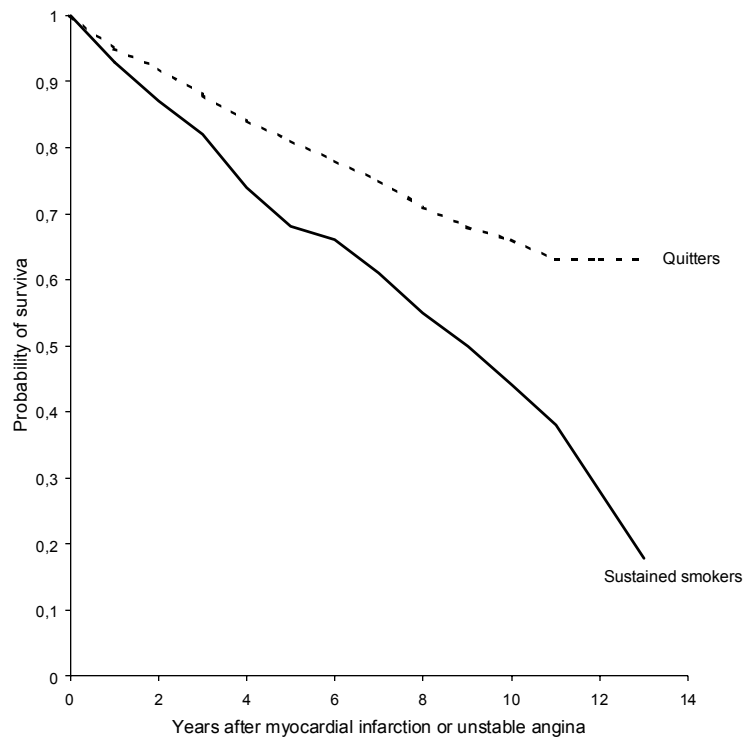


Table 1

The preprinted alternatives for answering were ranging from very low degree/very little satisfied (1) to very high degree/very much satisfied (5). The participants were asked to be as honest as possible when answering the following questions:

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1. Regarding the tobaccos effects on your heart, to what degree have you been informed about this from the hospital?
 2. To what degree do you feel you have been helped from the hospital in quitting smoking?
 3. All in all, how satisfied are you with the help you have received from hospital in quitting smoking?
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Table 2

The mean (SD) patient satisfaction scores at 12 months follow up, ranging from 1 (not satisfied) to 5 (very satisfied).

	Intervention group (n=100)	Control group (n=117)	Significance level*	95 % CI of the difference
The degree of information on the tobacco's effect on the heart	4.4 (0.7)	3.5 (1.2)	<0,001	0.6-1,1
The degree of help from the hospital in quitting smoking	3.9 (1.0)	2.3 (1.2)	<0,001	0,2-1,8
The level of satisfaction of the help from hospital in quitting smoking	4.1 (0.8)	2.8 (1.2)	<0,001	1,0-1,6

*p value, assessed by the independent samples t-test.