

Results of a Comprehensive Workplace Program for the Prevention and Treatment of Smoking Addiction

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OBJECTIVES: To assess a comprehensive smoking prevention and treatment program in an electrical appliances company with 1600 employees.

MATERIAL AND METHODS: The program included smoking restrictions with the designation of smoking areas and the offer of smoking cessation treatment for the smokers affected. Study variables were age, sex, nicotine dependence (Fagerström Test), carbon monoxide in expired air, adherence to therapy, and smoking abstinence at 1 week, 1 month, 3 months (end of treatment), and 6 months. Successful smoking abstinence was defined as continuous abstinence from the beginning of treatment.

RESULTS: Smoking prevalence was 34.8% and 19.5% of smokers requested treatment (77.4% men and 22.6% women). Mean (SD) age was 41.3 (10.3) years. Mean score of nicotine dependence was 5.3 (2.6) and the mean quantity of carbon monoxide in expired air was 35.6 (23.7) ppm. Adherence to therapy was good in 80% of patients. Rate of abstinence was 57.5% at 6 months, signifying a 4% reduction in prevalence.

CONCLUSIONS: Workplace smoking cessation programs reduce prevalence and facilitate the establishment of smoking restrictions at the worksite. Companies are convenient settings for the implementation of programs aimed at smoking prevention and treatment.

Key words: Tobacco. Workplace. Occupational health. Smoking cessation.

Resultados de un programa integral de prevención y tratamiento del tabaquismo en el entorno laboral

OBJETIVOS: Evaluar un programa integral de prevención y tratamiento del tabaquismo en una empresa de electrodomésticos con 1.600 trabajadores.

MATERIAL Y MÉTODOS: El programa incluyó restricción para fumar con delimitación de espacios para fumadores y oferta de deshabituación tabáquica a los fumadores afectados. Las variables de estudio fueron: edad, sexo, dependencia a la nicotina (test de Fagerström), monóxido de carbono en aire espirado, cumplimiento del tratamiento y abstinencia en el consumo de tabaco a la semana, al mes, a los 3 (fin del tratamiento) y a los 6 meses. Se definió como éxito la abstinencia mantenida en el consumo de tabaco desde el inicio del tratamiento.

RESULTADOS: La prevalencia de tabaquismo era del 34,8%. Solicitaron tratamiento el 19,5% de los fumadores (un 77,4% eran varones y el 22,6%, mujeres). La media de edad (\pm desviación estándar) era de $41,3 \pm 10,3$ años. El valor medio de la dependencia a la nicotina fue de $5,3 \pm 2,6$ puntos y la media de monóxido de carbono en aire espirado de $35,6 \pm 23,7$ ppm. El cumplimiento del tratamiento fue bueno en el 80% de los casos. El índice de abstinencia fue del 57,5% a los 6 meses, lo que supone una reducción de la prevalencia del 4%.

CONCLUSIONES: Las intervenciones sobre el tabaquismo en el entorno laboral reducen la prevalencia y facilitan establecer restricciones del consumo en el lugar de trabajo. La empresa representa un escenario oportuno para realizar intervenciones dirigidas a la prevención y tratamiento del tabaquismo.

Palabras clave: Tabaco. Entorno laboral. Salud laboral. Deshabituación tabáquica.

Introduction

Spain continues to have high rates of smoking among the general population. According to the 2001 National Health Survey (Encuesta Nacional de Salud de 2001),

52.6% of men and 43.5% of women between the ages of 25 and 44 are smokers¹; most of the working population of Spain is within this age-group. The employment rate in Spain is 67% for men and 43% for women,² and the length of the working week for full-time employees is 40 hours. These statistics make it easy to understand why the introduction of smoke-free workplaces is an important step towards reducing avoidable mortality and morbidity among the working population.

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Nicotine addiction interventions at the workplace have proven particularly effective in reducing smoking. They help to increase the number of ex-smokers, and the workers who continue smoking smoke fewer cigarettes a day.³⁻⁵ Other beneficial results have been described such as reduction in absenteeism and other costs that smoking workers occasion.^{6,7}

Reduction of smoking inside the company leads to diminished indoor tobacco smoke pollution, protecting the health of smokers and nonsmokers alike.^{8,9} For nonsmoking workers who live with nonsmokers, the workplace might be the only contact with air polluted with tobacco smoke, an additional risk that neither the worker nor the company can assume.

Exposure to carcinogenic components in tobacco smoke affects more people than exposure to any other carcinogenic chemical substance in the workplace.¹⁰ Given that air polluted with tobacco smoke has been declared carcinogenic by the International Agency for Research on Cancer, exposure at the workplace must be regulated and the banning of smoking at work is foreseeable in the near future.¹¹

The objective of this study, carried out in a company, was to evaluate a comprehensive program which combined smoking restrictions at the worksite with the offer of smoking cessation treatment for the smokers affected.

Material and Methods

A comprehensive smoking prevention and treatment program was carried out in an electrical appliances manufacturing company which had 2 plants in the same region and a workforce of 1600 people. The implementation of all phases of the program was estimated to last 18 months but the program became an ongoing one and is still active and being continuously assessed.

The program consisted of the introduction of smoking restrictions, the designation of smoking areas, and the offer of smoking cessation treatment for the affected smokers.

Development of the Program

The program consisted of several phases which are outlined in the Table. In the initial phase, a working group

was created with representatives from management of the areas involved (safety, medical attention, personnel, engineering, production, etc) and employee representatives (trade unions, company committee). A schedule for each phase was created and specific material prepared to raise awareness of the hazards and to inform the employees. In the information phase, each employee received a letter from management about the program, posters were hung in several areas of the company, smoking areas were created, signs were erected, and informative videos were played in frequented areas. During the development phase, a smoking cessation program was started, fully financed by the company (including pharmacological treatment), and smoking was banned throughout the workplace except in the designated smoking areas. The restriction was added to the internal regulations of the company and was an obligation subject to sanction. Smoking cessation treatment was offered to all smoking staff, irrespective of whether they were on permanent or temporary contracts, and was applied outside working hours but at times compatible with shifts to provide maximum access. The program was carried out by medical staff from a smoking cessation unit. Enrollment criteria consisted of being a smoker, working for the company, and voluntarily joining the program. Exclusion criteria included psychiatric disease with acute symptoms, other active drug dependence, and pregnancy.

Multicomponent smoking cessation treatment (pharmacological treatment and cognitive-behavioral psychotherapy) was applied in groups and consisted of 9, 90-minute group sessions over 12 weeks in addition to an initial individual session to determine medical history. Pharmacological treatment, which was determined according to the degree of nicotine dependence diagnosed at the individual interview, was discussed with the smokers and their assent was negotiated. Combined nicotine replacement therapy was applied (quick response and/or transdermal substitutes) or bupropion, depending on contraindications and the personal characteristics of the smoker.

Finally, in the evaluation phase, abstinence was assessed in the treatment groups and compliance with the ban was confirmed.

Study Variables

The study variables were the following: age, sex, nicotine dependence according to the Fagerström test, carbon monoxide (CO) in expired air, adherence to treatment, and

TABLE
Intervention Phases Carried Out at the BSH Company, Spain

Phases	Objetives	Content
Initial	Intervention designed according to company characteristics	Work group created Commitment of management Agreement of employee representatives Preparation of schedules and materials
Informing	Intervention publicized to whole company	Letter to employees Creation of smoking areas Signs erected
Development	Implementation of intervention	Smoking restrictions introduced Smoking cessation program started
Assessment	Assess results obtained	Fulfillment of restriction assessed Smoking cessation program assessed
Maintenance	Continue project	Results publicized inside and outside the company Medium-long term benefits assessed (absenteeism)

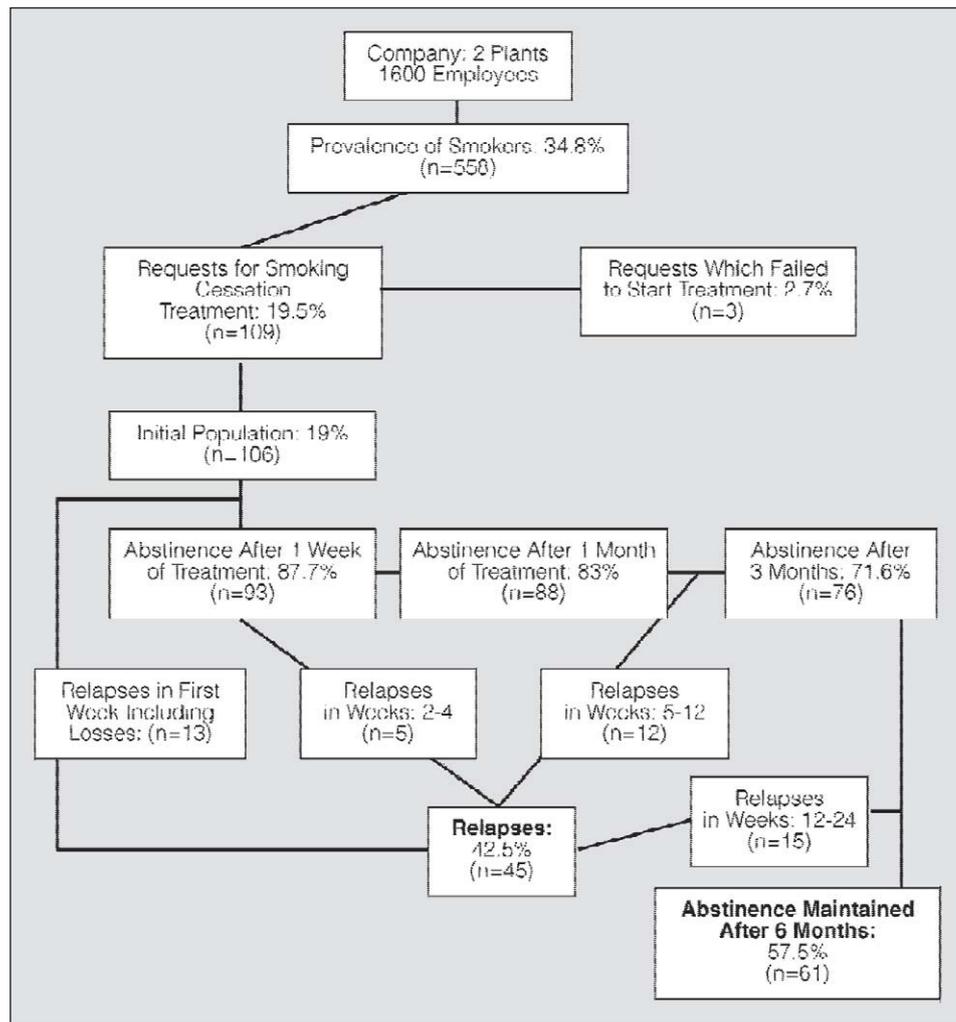


Figure 1. Evolution of the smoking cessation program at BHS.

smoking abstinence. CO was measured with a CO-oximeter (Mini Smokerlyzer, Bedfont Scientific Ltd, Rochester, UK), and a score of 10 ppm was taken as indication of smoking. Patients were regarded as lost if they did not attend any of the treatment sessions after the initial interview. Adherence to smoking cessation treatment was assumed if patients attended 4 or more group sessions; otherwise, nonadherence was assumed.

Abstinence was checked at all treatment sessions and the patient was considered successful on verbal self report of total abstinence verified by a score of 10 ppm or less in expired CO. The rate of abstinence was calculated after 1 week, 1 month, 3 months (end of treatment), and 6 months. Success was defined as smoking abstinence from the beginning of the study.

Statistical Analysis

A database was created using the SPSS statistical package, version 10.0, for Windows. Results were expressed as means (SD) with 95% confidence intervals (CI), and as percentages. The χ^2 test was used to compare percentages, and a *P* value of less than .05 was considered significant.

Results

The medical service's clinical records of 1600 employees from the year prior to the study were examined (17.2% women, 82.8% men) to determine who were smokers. Prevalence of smokers among staff was 34.8% (n=558) according to the records. One hundred nine smokers requested treatment, 19.5% of the total, and, of these, 3 patients (1 woman and 2 men) did not attend the first treatment session and were excluded from the study. The course of the study and results of the populations enrolled are depicted in Figure 1.

Follow up was performed on 106 patients—24 women (22.6%) and 82 men (77.4%)—with a mean age of 41.3 (10.3); 95% CI, 39.3-43.3. Nicotine dependence, measured with the Fagerström test, was reflected by a mean score of 5.3 (2.6), 95% CI, 4.8-5.8. Mean scores of CO in expired air were 35.6 (23.7) ppm; 95% CI, 31.1-40.3.

Of the initial population that sought treatment (n=106), 8.5% (n=9) were lost according to the preestablished criteria. However, a parallel analysis of results was included, following intention-to-treat

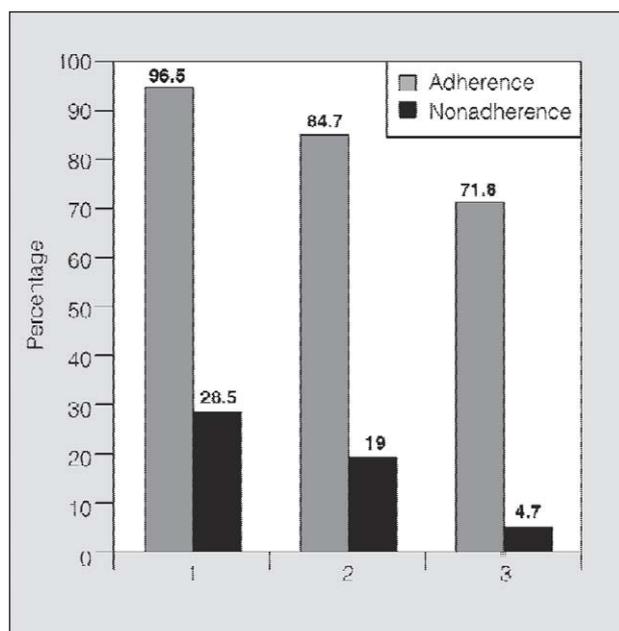


Figure 2. Differences in abstinence after treatment completion. 1: abstinence after 1 month; 2: abstinence after 3 months; 3: abstinence after 6 months. Treatment adherence: attendance at 4 or more treatment sessions; treatment nonadherence: attendance at less than 4 treatment sessions.

criteria, in which patients who did not attend treatment sessions were considered unsuccessful along with patients who did not achieve abstinence. Those losses were classified as relapses in the first week.

Eighty percent of patients (n=85) complied with treatment while 20% (n=21) were insufficiently compliant. After 6 months, CO-oximetry was performed on 100% (n=61) of abstinent patients and 40% (n=18) of still-smoking patients. The mean score of expired CO was 5 (2.4) ppm (range: 0-10 ppm) and 26.6 (22.2) ppm for compliant and noncompliant patients, respectively. Figure 1 shows how abstinence ranged from a success rate of 87.7% after a week's treatment to 57.5% after 6 months, a 4% relative reduction in prevalence with regard to the initial situation.

Significant differences ($P < .05$) were found at 1 month, 3 months, and 6 months between the abstinence rate of patients who adhered to treatment and those who did not. At 6 months, the abstinence rate was 71.8% for those who adhered and 4.7% for those who did not (Figure 2).

Smoking was banned throughout the workplace except in the designated smoking areas 6 months after the start of the program. Follow up was undertaken by the company. Restriction enforcement was incorporated into the internal regulations and resulted in an employee being sanctioned once.

Discussion

The results of this study indicate that smoking cessation interventions at the workplace reduce

prevalence and enable smoking restrictions to be introduced.

Prevalence was reduced by 4%, a rate which is consistent with the literature on working environments.^{4,12} A 73% increase in price would have been needed to achieve a similar reduction by raising the price of cigarettes, another method of demonstrated efficacy.⁴ The working population of Spain consists of nearly 19 million people, most of them between 25 and 44 years of age, and the prevalence of smoking is high among them. These figures indicate the enormous potential of workplace smoking cessation programs, still underutilized in this country. Two policies among those with the greatest impact on smoking prevention are banning smoking in public places and improving access to smoking cessation treatment.¹¹ The workplace offers an ideal setting, and reduces prevalence and intensity, as most studies including this one have shown.¹²⁻¹⁴

Of the workers who smoked, 20% sought treatment in the program; that percentage is slightly lower than the rate of smokers who reportedly wish to quit.¹⁵ The difference could be attributable to the fact that stating an intention in a questionnaire that does not include smoking cessation assistance is not the same as actually joining a smoking cessation program; it does indicate, however, that not all smokers want to quit smoking even when access to treatment is maximized and treatment is financed. This aspect needs confirming in future studies given its relevance to the cost of financing smoking cessation treatment.

One of the advantages of worksite interventions is that follow up and evaluation are easier.^{16,17} All smokers who enrolled in our study were followed up and abstinence was validated by CO-oximetry in 74.5% of workers who completed the treatment. There is little information on treatment completion in the literature. In a recent study with a treatment program of 7 sessions, 70% of patients fully completed the treatment; a similar percentage was found in our study (80%).¹⁸ The higher rate of success among patients who attend treatment sessions justifies performing them.

The objective of the intervention was to improve employees' health and agreement with employee representatives was sought from the beginning. The agreement was subsequently drawn up into a document with the consensus of the trade unions, and the company was declared smoke-free by the management. Smoke-free zones are defined as those areas where smoking is banned everywhere; however the provision of smoking zones is accepted as a temporary measure.¹⁰ Reduction in smoking is greater when smoking areas are not provided.⁴ The program was carried out following the recommended phases and with the involvement of the company health service, which provided valuable assistance that definitely contributed to the successful results. We regard it essential to define the objectives according to the characteristics of the company, to establish a schedule, and fulfill all components of the phases described.¹⁶ One of the

aspects most appreciated by management and employees alike (although not objectively measured) was the excellent acceptance of the program. Restrictions were fully complied with and did not create conflict despite the initial situation of smoking being permitted on the premises. The absence of conflict between smokers and nonsmokers is another advantage of workplace interventions,¹⁹ and was confirmed in our study. Smoking restrictions at the workplace are feasible and compliance perfectly possible in our sociocultural context.

The impact of this kind of intervention has been analyzed by the tobacco industry which has estimated the considerable economic losses it would incur if workplaces were made smoke free.²⁰ Consequently, one of their main strategies consists of avoiding and postponing the banning of smoking in public places, including workplaces, and using "scientific" arguments to raise questions about the damaging effect of passive smoking.²¹⁻²³

Smoking restrictions are an important component of smoking control policies because they protect nonsmokers from the damaging effects of inhaling tobacco smoke and encourage smokers to quit.²⁴ Quitting smoking is beneficial for public health, but also has major economic benefits caused by reduced morbidity, fewer working days lost, greater productivity, and fewer injuries and accidents at work, all of great interest to companies.¹⁶ At present, Spain has one of the highest prevalences of smoking in Europe and must use all possible settings in efforts to prevent and treat smoking. The workplace provides an ideal place for this kind of intervention, given its enormous potential and the repercussions smoking can have on public health.

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