Soz Praeventivmed 1990; 35: 125–128

Worksite Smoking Cessation Programs: Need in West Germany and Recommendations for Evaluation

Andreas Mielck

GSF – Institut für Medizinische Informatik und Systemforschung (MEDIS), Neuherberg

In West Germany, contrary to the USA, smoking cessation programs at the worksite are very rare. This article aims at promoting such programs. First, some empirical information on the need for worksite smoking cessation programs in West Germany is presented; this is followed by a short review of programs and evaluation methods in the USA; finally, some recommendations for the evaluation of worksite smoking cessation programs are developed.

The need for worksite smoking cessation programs in West Germany

Adverse health effects of smoking are well known. Smoking is the leading cause of death and disability among adults in the USA, mainly due to increased risks of lung cancer and coronary heart disease [1]. The same is probably true for West Germany [2].

One source of information on smoking in the West German population are surveys conducted by the "Ministry of Youth, Family, Women and Health". A survey, conducted in 1987 in a representative sample of the West German population above the age of 14 (N=1942) [3], produces results presented in table 1.

The table shows that about 57% of full-time employees, 34% of half-time employees and 63% of apprentices are regular or occasional smokers; there is, hence, an immense potential for smoking cessation programs at the worksite. This judgement is strengthened by the high percentage of smokers who have tried or who are trying to stop or to reduce smoking. A direct evidence is given by the fact that about 50% of the smokers are not strongly opposed to joining a smoking cessation program.

Smoking cessation or reduction programs are especially promising at the worksite for a number of reasons [1,4]: There, a large proportion of smokers can be reached and resources for smoking cessation programs can be centralized; also, the workplace potentially offers social support and reinforcement and, last but not least, the smoking cessation program is conveniently accessed by smokers. Despite these opportunities and the need briefly outlined above, no worksite smoking cessation programs have apparently been established in West Germany, as is indicated by a review of German literature from 1980 to 1989. Even the importance of such programs is stated rarely [5].

Tab. 1. Smokers at the worksite in West Germany

	full-time employees 650		half-time employees 103	apprentices 30
	smokers regular occas.		smokers regular & occas.	smokers regular & occas.
	250 (38,5%)	120 (18,5%)	35 (34,0%)	19 (63,3%)
tried to stop smoking	97 (38,8%)	33 (27,5%)	20 (57,1%)	9 (47,4%)
tried to reduce smoking	126 (50,4%)	48 (40,0%)	21 (60,0%)	9 (47,4%)
wish to stop smoking now	46 (18,4%)	12 (10,0%)	7 (20,0%)	3 (15,8%)
wish to reduce smoking now	68 (27,2%)	29 (24,2%)	4 (11,4%)	6 (31,6%)
participation in smoking programm				
– yes	12 (4,8%)	4 (3,3%)	0	0
– yes if success	33 (13,2%)	13 (10,8%)	5 (14,3%)	3 (15,8%)
– probably not	97 (38,8%)	46 (38,3%)	15 (42,9%)	6 (31,6%)
– surely not	88 (35,2%)	36 (30,0%)	12 (34,3%)	9 (47,4%)

Source: [3]
Regular smokers: regular smoking of cigarettes, cigars or pipes
Occas. smokers: occasional smoking of cigarettes, cigars or pipes (time frame not included in question)

It is true that a variety of anti-smoking programs has been offered in West Germany [2,6,7], the most widely used is probably the program "Eine Chance für Raucher. Nichtraucher in 10 Wochen", developed about 10 years ago by the "Ministry of Youth, Family, Women and Health". A survey from 1984 shows that

this program has been applied 1712 times, but no applications at worksites are mentioned [8].

Worksite smoking cessation programs in the USA

In 1985, about 30% of all workers in the USA were cigarette smokers [9], i e about the same proportion as in the general population (33% of men and 28% of women) [10]. Probably with a view to contain rising health care costs [11,12], the percentage of employers in the USA offering smoking cessation programs rose from about 15% in 1978 [9] to about 53% in 1988 [13]. Smoking cessation programs are "educational or skill-training efforts intended to help employees overcome the smoking habit" [9,p 88]. They can be directed towards smoking cessation or smoking reduction.

The final objective of a smoking cessation or reduction program is usually the reduction of costs for the employer due to smoking employees and not the reduction of smoking per se. Increased costs due to smoking can occur mainly in the following areas [9, 14, 15, 16, 17]: health insurance, life insurance, disability insurance, worker's compensation, fire damages, absenteeism and productivity. Very few studies try to assess the additional costs per smoker [4]. One study estimates that "smokers have 18% higher medical costs and are 43 percent more likely than non-smokers to miss more than a week of work because of health reasons" [18,p 32]. The cost of smoking cessation or reduction programs could be measured relatively easily but are rarely reported [18]. The financial costs for the employer are probably small, since participants do usually not join the program during working-time. One study estimates the cost per successful quitter at about $500 [16]. The leisure time cost for employee varies significantly among programs.

Up to 1986, evaluations of 20 programs were published [9]; four representative studies are discussed below (table 2).

The four studies presented in table 2 comprise different smoking cessation or reduction strategies: In study 1 the participants receive information from cancer-, heart-, or lung-experts on various aspects of smoking and they discuss the general benefits of a healthy lifestyle [19]; monetary incentives are used to reward successful quitters individually. Study 2 compares two different strategies in 5 companies; the "basic program" is a "six-week cognitive-behavioral program" [20, p. 198], the "competition program" includes an additional monetary incentive for all employees of the most successful company. Study 3 and 4 also compare two different strategies; in study 3 the "basic program" focuses on group discussions and on "sequentially reducing nicotine content (i.e. brand of cigarette), number of cigarettes smoked per day and percentage of each cigarette smoked" [21,p 487]; in the "social support group" each participant is additionally "paired with a partner with whom he or she was to discuss progress on a daily basis" [21,p 488]. In study 4 participants can choose to reduce or to stop smoking in the "basic program" or they have to try to stop smoking in the "cessation group"; both groups receive the information material of the "Quit and Win Program" (self-instruction material, consisting of educational and motivational components) and can join group sessions [22].

Tab. 2. Comparison of Worksite Smoking Cessation Programs, USA

Study 1 1983 [19]	Study 2 1986 [20]	Study 3 1984 [21]	Study 4 1988 [22]
Intervention			
7 month program with 171 white collar smokers (about 55% of all smokers)	6 week program with 107 white collar smokers in 5 companies (about 65% of all smokers)	6 week program with 24 white collar smokers	6 month program with 59 smokers (46% clerical/blue collar) (about 2% of all smokers)
	5 companies assigned to a) basic program or b) basic program & competition	random assignment to a) basic program or b) basic program & social support	random assignment to a) reduction group or b) cessation group
Outcome Variable			
Percentage of participants abstinent after six month (at time of assessment)	Percentage of participants abstinent after 6 weeks, still abstinent after 6 months	Percentage of participants abstinent after 6 weeks, after 6 months	Percentage of participants abstinent after 6 months, still abstinent after 1 year
	reduction in non-quitters after 6 weeks, after 6 months	reduction in non-quitters after 6 weeks, after 6 months	
Result			
abstinent after 6 months: about 85%	abstinent after 6 weeks: in a) 31% in b) 22% after 6 months: in a) 14% in b) 18%	abstinent after 6 weeks: in a) 17% in b) 17% after 6 months: in a) 27% in b) 17%	abstinent after 6 months: in a) 52% in b) 50% after 1 year: in a) 14% in b) 10%
Outcome Assessment			
self-report	self-report CO-level higher than 8ppm	self-report CO-level higher than 5ppm	self-report CO-level higher than 8ppm SCN-level higher than 80 g/ml
Evaluation Design			
non-experimental	quasi-experimental	experimental	experimental

These four studies, however, point to the major problems of the evaluation of worksite smoking cessation programs:

- As different programs are performed in different settings, it is hard to compare the effectiveness of

one program in different settings or the effectiveness of different programs in the same setting.
- Participants are usually white collar workers, it would be important to include more blue collar workers, since they have a higher smoking prevalence [4,9].
- Often small companies are selected. In large companies (see study 4) participation of smokers is low. Some studies do not even report the participation rate (see study 3).
- Most programs enroll only few smokers. Confidence intervals for the effect measures are usually not reported.
- There is no real control group, i e a group without any intervention. Thus it is not known how many smokers would have quitted without the program. In general, most smokers who quit do so on their own [23], but the spontaneous quit rate is not well known. Some authors suggest that about 5% of all smokers quit permanently per year [16,24,25]. Evaluations of programs do usually not take this "baseline-rate" into account.
- Different time frames are used for the outcome measurement. For example, study 2 assesses if participants were still abstinent after 6 months, study 3 assesses if participants were abstinent at the time point six months after the study had begun. The distinction between these two potential outcome measures is not discussed in the literature.
- Most studies have a follow-up period of 6 months, but 12 months, like in study 4, seem to be more appropriate [9,23] as relapses after 12 months of abstinence are very rare compared to relapses after 6 months.
- Some studies, even relatively recent ones like study 1, do not validate self-reported smoking status. Studies that do so, use different validation measures with different thresholds. Two major methods are used for the validation of the self-reported smoking status [26]:

  (a) Measurement of CO-level in samples of expired air. This measure has the disadvantage that the half-life time is only 2–6 hours and that other factors like exposure to heavy traffic can raise the CO-level. Thresholds of 5ppm and 8ppm are used in the studies described above.
  (b) Measurement of thiocyanate-level in saliva (SCN). This measure is more accurate since the half-life time is about two weeks and the potential for non-smoking related elevations is relatively small.
  Today, more tabacco-specific validation measures based on cotinine are preferred [29].
- Only some studies include as an outcome "smoking reduction".
- Results are less promising if the outcome is assessed more accurately (studies 1 and 3).
- Program drop-outs should be counted as smokers [9]; this is not always done (cf study 3), it would reduce the effectiveness measure.
- Most studies are poorly designed and evaluated [9, 14, 27]. Many of them, even relatively recent ones like study 1, use non-experimental designs. Out of 20 programs up to 1986 for which evaluations are published, 14 used a non-experimental, 2 used a quasi-experimental and only 4 used an experimental design [9]; experimental designs are usually used for comparing different programs and not for comparing a program with a non-intervention.

In summary, it is apparent that only very few good evaluations exist and that there seems to be no study that uses a true control group with no intervention in an experimental design. It is therefore difficult to assess the effectiveness of the programs, but studies 2, 3 and 4 suggest that more smokers quit or reduce smoking with the help of a program than without it and that different programs yield similar results.

Recommendations for the evaluation of worksite smoking cessation programs

It is important to estimate the effectiveness of a smoking cessation or reduction program carefully and to make the results comparable. Required elements are:
- use of an experimental design for the evaluation of the efficacy of a new program (for the evaluation of the effectiveness of an established program at a different site, other designs can be used for pragmatic reasons),
- estimation of the additional effect of the program by using a control group or by estimating the spontaneous quit rate based on other data,
- estimation of the participation rate,
- use of standard outcomes (eg percentage of quitters after 12 months),
- verification of smoking status by a standard CO-level and/or by SCN,
- a follow-up period of at least 12 months.

The role of cost-benefit analyses in this context, however, is equivocal. On the one hand they may be important to promote the idea of smoking cessation programs but, on the other, smoking cessation or reduction programs should primarily be health programs and not cost-savings programs [28]. Despite the lack of comprehensive cost-benefit analyses, many programs have already been started in the USA; an exact knowledge of potential benefits is probably not an essential to employers to start a program [11] and it can be recommended for West Germany too that cost-benefit analyses do not play a major role.

Summary

In distinction from the USA, worksite smoking cessation programs are not yet implemented and their importance is not yet discussed in West Germany. Data from a national survey show that a majority of employees in West Germany are regular or occasional smokers and that about 50% of them are not strongly opposed to joining a smoking cessation program. A review of worksite smoking cessation or reduction programs in the USA reveals necessary characteristics

of the implementation and evaluation of such programs in West Germany.

Résumé

Programme de désintoxication du fumeur au lieu du travail: une nécessité en Allemagne Fédérale et quelques recommendations pour l'évaluation

A la difference des Etats-Unis, en Allemagne Fédérale il n'y a pas de cours pour déshabituer à fumer au travail et une dicussion sur l'importance de ces programmes n'a pas eu lieu jusqu'à présent. Une exploitation d'un sondage représentatif montre qu'en Allemagne la plupart des travailleurs fument et que plus de 50 pour cent d'entre eux n'auraient à peine une opposition à participer à un cours de désintoxication. Une étude des programmes pour cesser ou réduire la consommation du tabac aux Etats-Unis montre les caractéristiques nécessaires pour l'implantation et l'évaluation de ces programmes.

Zusammenfassung

Raucherentwöhnungs-Programme am Arbeitsplatz: Bedarf in der Bundesrepublik Deutschland und Empfehlungen für die Evaluation

Im Unterschied zu den USA werden in der Bundesrepublik Deutschland noch keine Raucher-Entwöhnungskurse am Arbeitsplatz angeboten, auch eine Diskussion über die Wichtigkeit derartiger Programme wird bisher kaum geführt. Eine Auswertung von Daten einer repräsentativen Stichprobe zeigt, dass in der Bundesrepublik eine Mehrheit der unselbständig Beschäftigten Raucher sind und dass mehr als 50% von ihnen einer Teilnahme an Raucher-Entwöhnungskursen nicht absolut ablehnend gegenüber stehen. Ein Vergleich von Raucher-Entwöhnungskursen am Arbeitsplatz aus den USA ergibt wichtige Hinweise für die Implementation und Evaluation derartiger Programme in der Bundesrepublik.

References

[1] *Omenn GS, Thompson B, Sexton M, Hessol N,* et al. A randomized comparison of worksite-sponsored smoking cessation programs. Am J Prev Med 1988; *4(5):* 261–7.

[2] *Pitschel-Walz G.* Raucherentwöhnung – aber wie? Z Allg Med 1988; *64:* 624–8.

[3] Bundeszentrale für gesundheitliche Aufklärung: Aktionsgrundlagen 1987.

[4] *Warner KE, Wickizer TM, Wolfe RA, Schildroth JE,* et al. The economics of worksite health-promotion programs: A review of the literature. Ann Arbor MI: The National Center for Health Promotion, 1988.

[5] Institut Mensch und Arbeitswelt, ed. Gesundheit am Arbeitsplatz. Baden-Baden: G Kohl, 1987: 117 pp.

[6] *Stumpfe K-D.* Wie gewöhnen sich Raucher das Rauchen ab? Suchtgefahren 1988; *34:* 401–7.

[7] *Schmidt F.* Raucherentwöhnung. Reinbek bei Hamburg: Rowohlt, 1984: pp 123.

[8] *Kreutzer L, Stadler T, Schwartz-Deutz C,* et al. Dokumentation des Projektes der Bundeszentrale für gesundheitliche Aufklärung (BZgA): «Eine Chance für Raucher – Nichtrauchen in 10 Wochen». München, 1984.

[9] *Bibeau DL, Mullen KD, McLeroy KR, Green LW* et al. Evaluations of workplace smoking cessation programs: A critique. Am J Prev Med 1988; *4:* 87–95.

[10] *Cummings SR, Rubin SM, Oster G.* The cost-effectiveness of counseling smokers to quit. JAMA 1989; *261:* 75–9.

[11] *Conrad P.* Wellness in the work place: potentials and pitfalls of work-site health promotion. Milbank Q 1987; *65:* 255–75.

[12] *Hollander RB, Lengermann JJ, DeMuth NM.* Cost-effectiveness and Cost-benefit analyses of occupational health promotion. In: Everly GS, Feldman RHL, eds. Occupational health promotion. New York: J Wiley, 1985: 287–300.

[13] Data Watch. Business & Health 1989; Feb: 9.

[14] *Warner KE, Wickizer TM, Wolfe RA, Schildroth JE,* et al. Economic implications of workplace health promotion programs: A review of the literature. J Occup Med 1988; *30:* 106–12.

[15] *Woodall GE, Higgins CW, Dunn JD, Nicholson T.* Characteristics of the frequent visitor to the industrial medical department and implications for health promotion. J Occup Med 1987; *29:* 660–4.

[16] *Kristein MM.* How much can a business expect to profit from smoking cessation? Prev Med 1983; *12:* 358–81.

[17] *Kristein MM.* The economics of health promotion at the worksite. Health Educ Q 1982; 9 (Special Suppl.): 27–35.

[18] *Doherty K.* Is worksite wellness good business? Business & Health 1989; Feb: 32–6.

[19] *Stachnik T, Stoffelmayr B.* Worksite smoking cessation programs: A potential for national impact. Am J Public Health 1983; *73:* 1395–6.

[20] *Klesges RC, Vasey MM, Glasgow RE.* A worksite smoking modification competition: A potential for public health impact. Am J Public Health 1986; *76:* 198–200.

[21] *Mallot JM, Glasgow RE, O'Neill HK, Klesges RC.* Co-worker social support in a worksite smoking control program. J Appl Behav Anal 1984; *17:* 485–95.

[22] *Jeffery RW, Pheley AM, Forster JL, Kramer FM* et al. Payroll Contracting for smoking cessation: A worksite pilot study. Am J Prev Med 1988; *4:* 83–6.

[23] *Davis AL, Faust R. Ordentlich M.* Self-help smoking cessation and maintenance programs: A comparative study with 12-month follow-up by the American Lung Association. Am J Public Health 1984; *74:* 1212–7.

[24] *Russel MAH, Merriman R, Stapleton J, Taylor W.* Effect of nicotine chewing gum as an adjunct to general practitioner's advice against smoking. Br Med J 1983; *287:* 1782–5.

[25] *Russel MAH, Wilson C, Taylor C, Baker CD.* Effect of general practitioner's advice against smoking. Br Med J 1979; *2:* 231–5.

[26] *Weiss SM, Furmann CF, Everly GS.* The development of a smoking cessation program. In: Everly GS, Feldman RHL, eds Occupational health promotion. New York: J Wiley, 1985: 92–112.

[27] *Eddy JM, Gold RS, Zimmerli WH.* Evaluation of worksite health enhancement programs. Health Values 1989; *13(1):* 3–9.

[28] *Higgins CW.* The economics of health promotion. Health Values 1988; *12(5):* 39–45.

[29] *Lee PL.* Misclassification of smoking habits and passive smoking. A review of the evidence. Berlin, Heidelberg: Springer Verlag, 1988: 103 pp.

Acknowledgements

The author thanks Prof. C. Shy (University of North Carolina, Chapel Hill, USA) and Drs. J. John and W. Satzinger (GSF-MEDIS) for their support and critical comments.

Address for correspondence:

Dr phil, MPH Andreas Mielck
GSF – Institut für Medizinische Informatik und Systemforschung (MEDIS)
Ingolstädter Landstr. 1
D-8042 Neuherberg