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Workers participation in a nutrition education programme

by

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Abstract

Background. *Most studies on feasibility and impact of worksite health promotion programmes focus on health outcomes and do not report participation and process data. Therefore, we conducted a process evaluation of an employee nutrition education programme.*

Methods. *The study population comprised 361 middle-aged male employees who responded to a risk factor questionnaire and underwent a physical examination; 90% of baseline subjects were surveyed a second time at the end of the intervention period. The intervention programme consisted of personal counselling based on screening results, media messages, nutrition group sessions and environmental changes. Measures of participation, characteristics of respondents, barriers to participation and employees' perception of the programme were used to evaluate the education programme.*

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Results. *At baseline, the overall response rate was 81%, in nutrition classes 36% of the respondents enrolled. Unmarried employees, blue-collar workers and smokers were less likely to participate in these group sessions. Among nonparticipants, lack of time and existing good health were the most given reasons for not participating. The overall employees' rating of the programme was positive.*

Conclusions. *This project demonstrates that in a worksite education programme high rates of initial participation can be achieved. However, the diminished enrollment of smokers and blue-collar workers in group sessions supports concern that a health programme may not equally reach all segments of the workforce.*

Key-words

Health promotion, nutrition, participation, process evaluation, worksite.

Introduction

Results from epidemiological, clinical and experimental studies have linked Western eating patterns with the occurrence of chronic diseases. Along with other factors, nutrition plays a key role in the development of coronary heart disease, some cancers and diabetes mellitus (1-3). The habitual eating pattern in Western countries is characterized by a high energy intake, an overconsumption of (saturated) fat, cholesterol, sugar and salt (1-3). Nutrition education and interventions to promote healthy eating are becoming a common feature in the management of chronic conditions and risk factor reduction (2). In the last decades the interest in workplace health promotion programmes is growing (4-5). Since employees spend a major part of their time at work, the workplace could be a particularly accessible and appropriate place to reach people about health promotion including nutrition education programmes (6-7).

Some trials at the worksite have been effective in achieving lasting changes while others were limited by methodological or practical issues (8-12). Most of the studies evaluate the effectiveness of the programmes by outcomes that are related to employee health (13). These outcomes include risk behaviours (smoking) and physiological measures (weight, serum cholesterol level). More recently, researchers are beginning to recognize the importance of participation and of evaluating the quality of health promotion activities. Assessing and increasing participation rates is important because of the

impact on programme justification, effective delivery and generalizability of results (14-16). A programme that reaches over 50% of employees is successful even if only a small percentage (e.g. 20%) make permanent behaviour changes. In contrast a programme that reports good long-term results among participants but is not able to attract a minimum number of participants is, in most situations, not a good investment. In his review, Glasgow concluded that participation is both an important process measure and an outcome that should be reported routinely. Numerous factors influence participation in health programmes, both at the personal and at the worksite level. For example, women participate more frequently than men (except for fitness activities) and white-collar employees tend to participate more than blue-collar workers. Some studies suggest that the healthiest workers (non-smokers, exercisers) and those who are more motivated or more ready to change are more likely to enroll (17-23).

Objective dimensions of worksites such as size, type of industry are related with participation as well as the more subjective, interpersonal aspects of the workplace. A perceived supportiveness of the management, the use of existing communication channels and company services contribute positively to enrollment (7, 14, 17, 24).

Given the primary emphasis on outcomes for assessing a programme's success, process evaluation is rarely reported in detail (25-26). Besides extent of health activities, awareness and participation, this part of evaluation considers quality of the delivered activities (27). Research questions that include items such as meaningful, engaging, understandability and fun are recommended.

Described below are process evaluation measures of a nutrition intervention programme for the worksite. The aim of this project was to reduce cholesterol level across the employee population by promoting dietary changes. The evaluation focuses on intervention approach and activities, on participation rates and exposure to mass media, on characteristics associated with enrollment and barriers to participation and finally, on level of satisfaction of the participants with the activities.

Methods

Recruitment

The project involved a quasi-experimental design and was carried out during the period October 1992-March 1994. As middle-aged men

are at the highest risk to develop cardiovascular diseases, six local worksites from the chemical and metal industry with a predominantly male population (95%) were contacted by the research team. Four sites ranging in size from 200 to 500 employees, all Caucasians, agreed to participate in the cardiovascular screening and intervention study. Two companies were randomly assigned to intervention and two to control conditions. A personal invitation letter was sent to all male employees, aged 35 to 59 years.

Baseline measures

Data on sociodemographic factors, health behaviour, nutrition knowledge and intention to participate in a nutrition education programme were collected by self-administered questionnaires. Dietary habits were assessed through a one-day food record and a semi-qualitative questionnaire. Staff reviewed all forms for completeness and implausible answers and resolved problems with respondents at the time of the physical examination. Using standardized procedures, anthropomorphic measurements (height, weight) were taken, two blood pressure readings were made with a random-zero sphygmomanometer and lipids (total cholesterol, high density lipoprotein cholesterol) were determined. Body mass index was calculated as weight divided by the height squared and ≥ 27 was used as the cut point for defining obesity. Persons with a cholesterol level above 250 mg/dl were classified as hypercholesterolemic. Hypertension was defined as systolic blood pressure $\geq$ 160 mmHg and/or diastolic blood pressure $\geq$ 95 mmHg.

Assessments were conducted during work time in the company medical facility. Confidentiality was guaranteed; copies of the results were sent to the family doctor and to the occupational physician at the employees' request.

Intervention programme

To help participants to adopt a lower fat and cholesterol eating pattern, a three-month education programme was designed (28-30). Baseline results were used to inform the intervention in two ways. Data on prevalence of risk factors and on nutrition knowledge of the target group helped to set priorities for activities to conduct. Questions probing for the employees' interest and readiness to change eating habits, indicated that 85% of the workers fell in the "somewhat" motivation level. Therefore, most activities were provided that appealed to persons at this level of readiness or "contemplation stage of change" (31).

To develop a calendar of activities, promote and implement intervention activities, a workplace steering committee with representatives drawn from the medical and personnel service, the unions and the university staff was established. The top management provided his full support to the project and made it possible to organize several intervention activities on company time and on site and to use existing networks and facilities. As a result of resource limitations and the wish of avoiding employee costs, existing and tested activities were used as much as possible and the implementation period was limited to three months. Table 1 gives a summary of the programme activities with their objectives. For a start the classical cardiovascular risk factors (hypercholesterolemia, smoking and hypertension) were outlined in a 15-minute video session. A video was presented to the entire working population during a safety meeting and was followed by a question and answer period.

In a next step, each intervention participant received during a personal counselling his results from the health check and got feedback on his own risk factor profile. Participants who were prevented from coming, received a written interpretation of their results.

Throughout the campaign, mass media was used to stress the relation between nutrition and cardiovascular disease and to disseminate information. Posters were put up in public places and on the workfloor, leaflets with advice how to reduce the amount of dietary fat were circulated and pamphlets were used to announce other activities. To engage social support and to enhance skills in choosing and preparing food low in fat and cholesterol, group sessions were organized outside working hours on the company premises. In a personal letter sent at home, all

TABLE 1
Overview of the programme activities and the objectives

	Activity	Objective
1.	Video presentation	Awareness of general risk factors and knowledge
2.	Personal counselling	Awareness of personal risk factors and motivation
3.	Posters	Awareness and knowledge
4.	Cafeteria messages	Awareness and knowledge
5.	Nutrition group session	Knowledge, attitudes and skills training, social support
6.	Newsletter	Knowledge, maintenance Feedback
7.	Review/change cafeteria food choices	Reduction of fat

intervention participants were invited with their wife or partner to a 2-hours session. These sessions were conducted several times in small groups (20 to 30 participants) by dieticians and provided an opportunity to demonstrate and discuss a series of topics, including the fat content of food, food labelling, guidelines how to break old habits and establish new ones.

Simultaneously meetings were held with the food service managers in order to build an environment supportive of the advised eating habits. Menus were reviewed and revised, several messages appeared along the cafeteria food line and on the tables to encourage the employees to make a healthy food choice.

Finally, to reinforce the given messages and to give feedback to the participants, a comprehensive newsletter was distributed towards the end of the campaign. Besides the educational content this newsletter also included aids to behaviour change such as quizzes, recipes.

Postintervention measures

To record number of participants in personal counselling and group sessions, registration forms were used by the research team during these activities. After 3 months, a follow-up questionnaire was administered to all 361 intervention subjects to obtain participation rates and programme evaluation. Awareness and exposure to media messages were measured through use of binary items "yes" or "no", for example "Did you notice the posters on the workfloor? Did you read the newsletter?". The programme evaluation portion of the follow-up questionnaire included level of satisfaction of the participants and their opinion about the project. Acceptability, understandability of messages, usefulness of (certain aspects of) the activities were assessed on a three-point scale written as "no, not really", "somewhat" and "yes". Other questions were open-ended to identify barriers to participate. Finally, participants were asked to indicate which activity they approved most of and which component they would not recommend to administer to other employees.

Statistical analysis

The data that were collected with the questionnaires, the registration and evaluation forms were analyzed using the SPSS-statistical computer package (32). Univariate analysis was performed to calculate participation rates by sociodemographic and health characteristics and their 95% confidence intervals. The independent variables under study were

dichotomized into two classes according to their median or by using their natural classification. The ratio of the proportions of participants in each of these classes, was defined as the "relative participation rate". In multivariate analysis, forward stepwise logistic regression was used to select a subset of significant variables that were independently related to participation in the nutrition group sessions. Variables were entered or removed from the model sequentially according to the Wald chi-square statistic. A significance level of 0.05 was used as a cut-off value for removing variables.

Results

Participation and exposure to mass media

In the intervention worksites 361 out of 444 middle-aged employees (81%) gave informed consent. Of these 361 participants at baseline, 325 completed the follow-up questionnaire after the intervention programme (90%). Table 2 lists the percentage and number of individuals in the intervention activities. The video session was attended by 170 persons (52%). Two hundred ninety-two employees (81% of the participants at baseline) were personally provided with feedback and advice with regard to their baseline measurements whereas results were mailed to 69 men. Ninety-five percent of the responders had noticed the posters at the worksite and 87% had actually read their slogans. The cafeteria messages were perceived by 192 participants and were read by 115 employees. In the nutrition group sessions, 131 men enrolled (36% of eligibles). According to the registration forms, two employees in every

TABLE 2

Participation rates (% and N) in the intervention activities according to registration and 325 evaluation forms

	Activity	%	N
1.	Video	52%	170
2.	Personal counselling	81%	292
3.	Posters		
	A. perception	95%	308
	B. reading	87%	285
4.	Cafeteria messages		
	A. perception	59%	192
	B. reading	57%	184
5.	Nutrition group session	36%	131
6.	Newsletter (reading)	76%	248

three were on this occasion accompanied by their wife or partner. Each of the 361 participants received a newsletter but only 248 men (76%) mentioned going through it.

Characteristics of the study population

Baseline characteristics of the participants in the intervention programme were as follows: mean age of 43.6 years, smoking prevalence of 35%, mean total cholesterol concentration was 223 mg/dl and about 23% of participants had cholesterol levels exceeding 250 mg/dl. Table 3 compares sociodemographic variables and health status between respondents who attended the nutrition group sessions (N = 131) and those who did not (N = 230).

Age, education, job category, marital status, and smoking were significantly associated with enrollment in the nutrition group sessions. Older, higher educated employees and white-collar workers were more likely to attend the group sessions. Married employees and nonsmokers were more interested than unmarried or single employees and than those who smoked. Nutrition knowledge, and other health characteristics showed no statistically significant association with participation. However, participants tended to be more active, to have a higher blood pressure and cholesterol level. In an attempt to identify those characteristics that best predict participation, a stepwise logistic regression analysis was performed. The variables job category ($p = 0.007$), smoking ($p = 0.01$) and marital status ($p = 0.03$) were positively and significantly associated with participation and thus confirmed as independent predictors.

TABLE 3
Relative participation rates in group sessions, by sociodemographic and health characteristics

Variable	Relative participation	95% CI
Age (> 50 vs ≤ 50 years)	1.27	(1.01, 1.59)
Education (high vs low)	1.27	(1.03, 1.57)
Job category (white vs blue-collar)	1.35	(1.11, 1.64)
Marital status (married vs unmarried)	1.36	(1.15, 1.61)
Smoking (no vs yes)	1.29	(1.11, 1.50)
Physical activity (high vs low)	1.19	(0.97, 1.46)
Body mass index (≥ 27 vs < 27 kg/m^2)	1.12	(0.85, 1.48)
Systolic BP (≥ 160 vs < 160 mmHg)	1.31	(0.77, 2.22)
Serum cholesterol (≥ 250 vs < 250 mg/dl)	1.27	(0.95, 1.71)
On a diet (no vs yes)	1.14	(0.61, 2.16)
Nutrition knowledge score (≤ 3 vs > 3)	1.17	(0.89, 1.54)

The employees who did not complete the follow-up questionnaire (N = 36) were not different from those who did (N = 325) with regard to age, smoking habits, education, cholesterol level and nutrition knowledge (data not shown).

Reasons for not attending nutrition group sessions

The follow-up questionnaire provided some clues to why subjects chose not to participate in the group sessions. Table 4 presents the whole of given reasons: three subsets of answer categories could be identified. In the first place, several problems of time schedule (time not suitable/absent those days/too busy) and practical obstacles were mentioned (item 1-10). Other frequently cited reasons were a perceived good health status or behaviour (item 11-13) and finally, lack of interest.

Employees' evaluation of the programme

Employee satisfaction with the intervention programme was high. The majority of participants reported that they received useful information with regard to healthy food in an understandable and acceptable way. More than 50% of the intervention group mentioned a change in eating habits. At least half of the respondents who attended the nutrition sessions

TABLE 4

Response to the question: what made you decide not to attend the nutrition session (asked of 190 employees who did not participate)

		Reason for not participating	N
I.		*Practical reasons*	
	1.	Time was not suitable	60
	2.	Too far from home	26
	3.	I could not find a babysit for the children	13
	4.	I was absent those days (sick or on holiday)	23
	5.	My wife could not come along	9
	6.	I forgot all about the invitation	5
	7.	I prefer to follow such sessions outside the company	4
	8.	I did not receive an invitation	1
	9.	Something unexpected prevented me of coming	2
	10.	Too busy with other things	15
II.		*Perceived good health status of behaviour*	
	11.	My results of the health screening were good	22
	12.	I already have good eating habits	12
	13.	I am already under the care of a physician	2
III.		*Lack of interest*	11

The number of responses is greater than the number of respondents because some people gave multiple answers.

ranked this intervention component as most interesting activity. The group of employees who did not follow the group session considered the personal counselling as most relevant component; the newsletter was the next most frequently cited benefit. The cafeteria messages received in both groups the lowest level of appreciation (data not shown).

Discussion

Participation is a key to programme effectiveness and success. The potential impact of worksite health programmes is limited by nonparticipation, especially among demographic subgroups and those who could benefit most from health behaviour change. We implemented a nutrition education programme in companies with no health promotion history and achieved a high participation in baseline screening. This rate compares well with participation rates in other studies that ranged from 20% to greater than 90% (19-23, 33-37). Levels of participation in other common forms of health activities are as expected. Mass media strategies (posters, newsletters) are used to reach large numbers of people (in this study 87% and 76%) but they are less effective to teach skills for behavioural change. Education strategies such as group sessions provide intense and durable conditions for skills-learning but they are less effective in reaching people: the participation rate in our nutrition sessions was limited to 36% (26).

To increase the internal validity of the study by assessing a possible selection bias, we compared the individuals who participated in the initial health screening but not in the nutrition session with employees who selected themselves into these sessions. Nonsmokers, married and white-collar workers were more likely to be recruited. This trend was also observed in other studies that showed that participants were more likely to be of higher social class or education and less likely to smoke (17, 19, 21). Participants in the group sessions tended to be older than the nonparticipants. In literature, age is usually unrelated to participation, although both positive and negative relationships have been reported (17). The sessions preferentially enrolled people who had higher levels of the risk factors for cardiovascular disease. In the studies reviewed by Stange et al. health status was not consistently associated with participation (19). The present results probably reflect the greater health interest of older men since an increase in blood pressure and in cholesterol level with age is well documented. Also, older personnel have more years of employment in the organization and the social support to participate in intervention programmes may be greater among these employees.

To maximize participation in specific programme activities, you need to know why people are not participating. The perceived barriers, specifically, lack of time and/or facilities to return after hours to attend the nutrition sessions indicate the importance of convenience. The most frequent accessibility recommendation is to offer activities on site on company time.

The initial high participation in this population may have resulted in the inclusion of participants who were not sufficiently motivated to complete the intervention study. As attrition rate was low (10% at 3-month follow-up) this is probably not the case. A potential bias due to drop-out of employees can be ruled out.

The programme emphasized on brief and low intensity activities. A major strength of the study includes that in future such education programme can be reproduced easily by company medical services and employees. Necessary data to plan the intervention can easily be collected at the different worksites: health habits during annual employee health screening and sociodemographic information from personnel records. With minimal support of outsiders and low costs, existing safety and health committees can plan, promote and implement the described programme that has proven to be successful, at least at the level of initial participation and acceptability.

The various components of the intervention were evaluated from the perspective of the employees. This method provides initial insights regarding the critical components and characteristics of successful health programmes. Favourable process ratings were obtained for the personalized feedback after the medical screening and for the nutrition session. Following directly from these observations is that individual counselling and support is needed in addition to the general health promotion at the worksite.

A possible limitation of the study lies in the fact that the programme was only open to male employees, aged 35-59 years. However, a programme effective in reaching middle-aged male employees, will probably be able to motivate women and younger people who showed in other studies a greater concern about health and a desire to improve their condition. When a more heterogeneous employee population is targeted, some differences in strategy may be required i.e. addition of incentives, competitions, more practical demonstrations. The intervention period of three months may be looked at as another weakness of the study. A long-term follow-up may reveal different results. Much of the worksite literature is based on short-term programmes but researchers have

argued that ongoing programmes are more likely to produce lasting behaviour changes (17). However, long series of sessions may result in lower attendance rates and loss of interest.

In conclusion, the data provide evidence that intervention materials and activities reach employees in the worksites. Knowledge, awareness and participation are the first – but by no means sufficient – steps towards the success of programmes. Additional strategies to maintain high rates of participation and to recruit specific groups of workers such as smokers and blue-collar workers are required. Information generated from process evaluation is not a substitute for programme effects. Therefore, outcome variables related to risk behaviour change will be reported in the near future.

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Samenvatting

Achtergrond. De meeste studies naar doenbaarheid en impact van campagnes op de werkplek rapporteren enkel gezondheidseffecten en weinig of geen participatie en evaluatiegegevens. Wij besloten daarom een evaluatie uit te voeren van een campagne rondom gezonde voeding in het arbeidsmidden.

Methoden. De studiegroep bestond uit 361 mannelijke werknemers van middelbare leeftijd die gestandaardiseerde vragenlijsten invulden en een bioklinisch onderzoek ondergingen. Negentig procent van deze mannen werd een tweede maal onderzocht na een interventieperiode van drie maanden. Het interventieprogramma bestond uit persoonlijk advies, gebruik van massamedia, groepsessies en omgevingsaanpassingen. Participatiecijfers, de kenmerken van deelnemers en redenen om niet deel te nemen in een interventieprogramma rondom gezonde voeding, werden gebruikt om het programma te evalueren.

Resultaten. Het participatiecijfer in het begin van de studie bedroeg 81%, in de groepsessies was dit 36%. Ongehuwde werknemers, arbeiders en rokers namen minder deel aan deze sessies. Tijdsgebrek en een goede gezondheid waren de belangrijkste redenen om niet deel te nemen in de voorlichtingsessies.

Conclusies. Deze resultaten tonen aan dat gezondheidscampagnes in de arbeidssituatie een hoog initieel participatiecijfer kunnen bereiken. De verminderde opkomst van rokers en arbeiders in de groepsessies bevestigen het vermoeden dat gezondheidsprogramma's niet alle groepen werknemers even vlot bereiken.

Résumé

La plupart des études concernant la faisabilité et l'impact des programmes d'intervention dans le cadre de l'entreprise rapportent surtout les effets de santé et rarement les taux de participation et une évaluation profonde. Un projet pour étudier la faisabilité d'un programme d'éducation nutritionnelle dans le milieu industriel a été effectué.

Méthodologie. Des données socio-démographiques et des paramètres de santé ont été rassemblés sur un échantillon de 361 hommes. Trois mois plus tard, 90% des candidats participaient encore dans un deuxième examen.

La campagne comportait un avis individuel, des informations médiatiques, des réunions d'informations et des interventions dans le milieu professionnel. Pour évaluer le programme nous avons utilisé les taux de participation, les caractéristiques des candidats et les raisons pour ne pas participer dans les réunions.

Résultats. Le taux de participation au début de l'étude était 81%, les réunions d'information attiraient 36%. Les analyses statistiques ont démontré que les employés mariés, les non-fumeurs et les fonctionnaires participaient plus volontiers aux sessions d'information. Les raisons pour ne pas participer aux réunions informatives étaient manque de temps et une bonne santé.

Conclusions. Les résultats montrent qu'un programme d'éducation nutritionnelle sur le lieu du travail peut réaliser des taux de participation hauts. La faible participation des fumeurs et des ouvriers est préoccupante et démontre qu'un programme d'intervention n'atteint pas toutes les catégories d'employés.

References

1. WHO, Report of a WHO study group. Diet, nutrition and the prevention of chronic diseases. Technical report series 797, WHO, Geneva, 1990.
2. WHO, Regional Office for Europe. Healthy nutrition: preventing nutrition-related diseases in Europe. WHO regional publications, European series, 24, 1988.
3. The Belgian Interuniversity Research on Nutrition and Health (BIRHN). Acta Cardiologica 1989; 54: 89-194.
4. FIELDING J E, PISERCHIA P V. Frequency of worksite health promotion activities. Am J Public Health 1989; 79: 16-20.
5. GLASGOW R E, TERBORG J R. Occupational health promotion programs to reduce cardiovascular risk. J Consult Clin Psychol 1988; 56: 356-373.
6. OSTWALD S K. Changing employees dietary and exercise practices: an experimental study in a small company. J Occup Med 1989; 31: 90-97.
7. GOMEL M, OLDENBURG B, SIMPSON J M, OWEN N. Worksite cardiovascular risk reduction: a randomized trial of health risk assessment, education, counseling, and incentives. Am J Public Health 1993; 83: 1231-1238.
8. MURRAY D M, KURTH C, MULLIS R, JEFFREY R W. Cholesterol reduction through low-intensity interventions: results from the Minnesota Heart Health Program. Prev Med 1990; 19: 181-189.
9. HARTMAN T J, HIMES J H, MCCARTHY P R, KUSHI L H. Effects of a low-fat, worksite intervention on blood lipids and lipoproteins. J Occup Environ Med 1995; 37: 690-696.

10. HEANEY C A, GOETZEL R Z. A review of health-related outcomes of multi-component worksite health promotion programs. Am J Health Promot 1997; 11: 290-308.
11. GLASGOW R E, TERBORG J R, HOLLIS J F, SEVERSON H H, BOLES S M. Take Heart: results from the initial phase of a work-site wellness program. Am J Public Health 1995; 85: 209-216.
12. BARRATT A, REZNIK R, IRWIG L et al. Work-site cholesterol screening and dietary intervention: the Staff Healthy Heart Project. Am J Public Health 1994; 84: 779-782.
13. GOMEL M, OLDENBURG B, SIMPSON J M, CHILVERS M, OWEN N. Composite cardiovascular outcomes of a work-site intervention trial. Am J Public Health 1997; 87: 673-676.
14. FIELDING J E. Health promotion and disease prevention at the worksite. Annu Rev Public Health 1984; 5: 237-265.
15. EASTWOOD B J, GREGOR R D, MACLEAN D R, WOLF H K. Effects of recruitment strategy on response rates and risk factor profile in two cardiovascular surveys. Int J Epidemiol 1996; 25: 763-769.
16. WONG Y, BAUMAN K E, KOCH G G. Increasing low income employee participation in a worksite health promotion program: a comparison of three common strategies. Health Educ Res 1996; 11: 71-76.
17. GLASGOW R E, MCCAUL K D, FISHER K J. Participation in worksite health promotion: a critique of the literature and recommendations for future practice. Health Educ Q 1993; 20: 391-408.
18. ROST K, CONNELL C, SCHECHTMAN K, BARZILAI B, FISHER E B. Predictors of employee involvement in a worksite health promotion program. Health Educ Q 1990; 17: 395-407.
19. STANGE K C, STROGATZ D, SCHOENBACH V J, SHY C, DALTON B, ROSS A W. Demographic and health characteristics of participants in a worksite health promotion program. J Occup Med 1991; 33: 474-478.
20. STANGE K C, STRECHER V J, SCHOENBACH V J, STROGATZ D, DALTON B, CROSS A W. Psychosocial predictors of participation in a worksite health promotion program. J Occup Med 1991; 33: 479-485.
21. CONRAD P. Who comes to work-site wellness programs? A preliminary review. J Occup Med 1987; 29: 317-320.
22. STONECIPHER L J, HYNER G C. Health practices before and after a work-site health screening. J Occup Med 1993; 35: 297-306.
23. SORENSEN G, STODDARD A, OCKENE J K, HUNT M K, YOUNGSTROM R. Worker participation in an integrated health promotion/health protection program: results for the Wellworks Project. Health Educ Q 1996; 23: 191-203.
24. SLOAN R P, GRUMAN J C. Participation in workplace health promotion programs: the contribution of health and organizational factors. Health Educ Q 1988; 15: 269-288.
25. NORMAN S A, GREENBERG R, MARCONI K et al. A process evaluation of a two-year community cardiovascular risk reduction program: what was done and who knew about it? Health Educ Res 1990; 5: 87-97.
26. FINNEGAN J R, MURRAY D M, KURTH C, MCCARTHY P. Measuring and tracking education program implementation: the Minnesota Heart Health Program experience. Health Educ Q 1989; 16: 77-90.
27. SUSSMAN S, DENT C W, STACY A W, HODGSON C S, BURTON D, FLAY B R. Project towards no tobacco use: implementation, process and post-test knowledge evaluation. Health Educ Res 1993; 8: 109-123.
28. GLANZ, K, MULLIS R M. Environmental interventions to promote healthy eating: a review of models, programs, and evidence. Health Educ Q 1988; 15: 395-415.
29. GLANZ K. Nutrition education for risk factor reduction and patient education: a review. Prev Med 1985; 14: 721-752.

30. GREGG W, FOOTE A, ERFURT J C, HEIRICH M A. Worksite follow-up and engagement strategies for initiating health risk behavior changes. Health Educ Q 1990; 17: 455-478.
31. PROCHASKA J O, DICLEMENTE C C. Stages and process of selfchange of smoking: towards an integrative model of change. J Consult Clin Psychol 1983; 51: 390-395.
32. NORUSIS M J. SPSS/PC + Advanced Statistics 4.0. Chicago, SPSS Inc., 1990.
33. PELLETIER K R. Clinical and cost outcomes of multifactorial, cardiovascular risk management interventions in worksites: a comprehensive review and analysis. JOEM 1997; 39: 1154-1169.
34. BYERS T, MULLIS R, ANDERSON J et al. The costs and effects of a nutritional education program following work-site cholesterol screening. Am J Public Health 1995; 85: 650-655.
35. GLASGOW R E, TERBORG J R, HOLLIS J F et al. Modifying dietary and tobacco use patterns in the worksite: the Take Heart Project. Health Educ Q 1994; 21: 69-82.
36. ERFURT J C, HOLTYN K. Health promotion in small business: what works and what doesn't work. J Occup Med 1991; 33: 66-73.
37. MCCARTHY P, LANSING D, HARTMAN T J, HIMES J H. What works best for worksite cholesterol education? Answers from targeted focus groups. J Am Diet Assoc 1992; 92:978-981.