Evaluation of a Worksite Injury and Illness Prevention Program: Do the Effects of the REACH OUT Training Program Reach the Employees?

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In this article, the authors report the findings of a 2-year study evaluating the effectiveness of REACH OUT, a train-the-trainer program developed to assist small businesses comply with California legislation, Senate Bill 198 (1989), requiring employers to implement a workplace injury and illness prevention program. Data from a case study sample of 8 companies, drawn from 151 Southern California small businesses participating in the larger study, are reported. Diagnostic walkthroughs were performed, and employee surveys collected at the case study companies approximately 2 months before the treatment group received the intervention and again 1 year later. Results indicate that greater corporate compliance led to employees’ perceptions of increased health and safety meetings and training sessions, which led to greater employer health and safety knowledge and improved employee health outcomes.

In 1989, the state of California passed Senate Bill 198, the most comprehensive health and safety legislation since the passage of the federal Occupational Safety and Health Act of 1970. Senate Bill 198 requires businesses not only to report and evaluate accidents but also to promote active health and disease prevention. The legislation specifically requires California employers to establish, implement, and maintain a workplace injury and illness Prevention Program (IIPP). An effective IIPP includes several key elements: (a) identification of the person responsible for implementing the program, (b) identification and evaluation of workplace hazards, (c) correction of unsafe conditions and work practices, (d) a training program to instruct employees in both general and job-specific safe work practices, (e) communication between employers and employees on health and safety matters, (f) procedures for ensuring that employees comply with safe work practices, (g) IIPP-related record keeping, and (h) investigation of occupational injuries and illnesses.

Unfortunately, Senate Bill 198 (1989) has not been widely implemented by California small businesses (California Senate Committee on Industrial Relations, 1992). Cal/OSHA’s records indicate that during the first year of the legislation, there were approximately 6,000 Senate Bill 198-related violations. The California Senate Committee on Industrial Relations found several problems with Senate Bill 198’s implementation. Their report criticized the legislation as being unclear. Cal/OSHA (1991) Guide to Developing Your Workplace Injury and Illness Prevention Program as being too general, and Cal/OSHA as inadequately assisting small businesses in developing their IIPPs.

National surveys have shown that small businesses offer fewer health promotion and disease prevention programs than large companies (Fielding & Pickens, 1989; U.S. Department of Health and Human Services, 1993). This variation is attributable to small businesses’ lack of staff, time, funds, and financial resources (Chenoweth, 1995; Stokols, Pelletier, & Fielding, 1995). Consistent with these national trends, earlier reported data from the present study indicated that larger corporate size was associated with a greater number of health and safety programs, more time spent implementing Senate Bill 198 (1989), higher levels of the respondents’ knowledge, and greater baseline (preintervention) levels of corporate regulatory compliance (Stokols, McMahon, Clifo- e, Wells, & Inman, 1995).
The REACH OUT Training Program

The REACH OUT Training Program was designed to assist small businesses develop and implement IPPs. REACH OUT is a peer-to-peer trainer program presented to individuals responsible for implementing the IPP in their organizations, usually workplace health and safety coordinators. REACH OUT is based on an acronym incorporating the eight basic implementation steps of an IPP, as outlined in he Appendix.

The REACH OUT Program was developed from a multidisciplinary perspective linking theories from the fields of social ecology, risk communication, occupational health and safety, and workplace health promotion. The social-ecological approach emphasizes the integration of behavioral and environmental modification strategies to enhance individual and organizational health. The ecological perspective suggests that interventions need incorporate both behavioral (active) and environmental (passive) components will be most effective in promoting health than interventions of narrower scope (Stoklos, 1992; Stoklos, Allen, & Bellingham, 1996; Williams, 1982). Active strategies of health promotion consist of lifestyle and behavior change programs that require individual voluntary effort, such as use of personal protective devices and proper lifting techniques. Passive strategies consist of organizational policies and environmental changes that require little or no individual effort, such as ergonomically designed workstations and policies requiring employees to take regular work breaks. The REACH OUT Program emphasizes both active and passive strategies of health promotion.

The social-ecological approach also highlights the importance of high-impact “leverage points” in health promotion (Stoklos, 1996). These leverage points are key to maximizing the impact and effectiveness of a health promotion or disease prevention program. In the REACH OUT Training Program, the coordinator is the primary high-impact leverage point. The program must go through the coordinator to reach the organization and thus be effective. Therefore, personal attributes of the coordinator, such as his or her level of knowledge about workplace health and safety and commitment to comply with the IPP legislation, are important factors that influence the program.

The REACH OUT Training Program also incorporates principles from the field of risk communication, as noted earlier. REACH OUT is an eight-letter acronym. Acronyms are popular mnemonic devices that have been shown to be effective tools for enhancing learning and improving recall (Nelson & Archer, 1972; Perrewyn & Stark, 1978). In addition to mnemonic, REACH OUT uses multiple training techniques such as oral presentation, videos, slides, and handouts and provides participants with a detailed volunteer manual they can take back to their workplaces for future reference and review. The REACH OUT Program also facilitates learning by encouraging active participant involvement and group interaction during the training.

The workplace injury and illness prevention study was designed to test the effectiveness of the REACH OUT Training Program. A model of the proposed effects was developed on the basis of a social ecological approach to workplace health promotion. See Figure 1 for the complete model. The model suggests that participation in the REACH OUT Training Program increases the coordinator’s knowledge of Senate Bill 198 (1992), thereby leading to greater organizational compliance, which, in turn, leads to the employees’ perception of increased health and safety meetings and training sessions, greater employee health and safety knowledge, and improved employee health outcomes. Previously reported results from the larger study (Stoklos et al., 1995) indicated that participation in the REACH OUT Training Program increased coordinator knowledge of Senate Bill 198 that led to greater corporate compliance with the legislation, thus supporting the first two hypothesized links of the model. In this article we report the three links of the model pertaining to the case study companies and their employees (the shaded portion of Figure 1).

Hypotheses

The proposed model suggests three employee-related hypotheses. First, it was predicted that greater corporate compliance with the legislation would be associated with employees’ perceptions of increased health and safety meetings and training sessions. Second, employees’ perceptions of increased health and safety meetings and training sessions were predicted to be associated with greater employee health and safety knowledge. Third, greater health and safety knowledge was predicted to be associated with improved employee health outcomes, such as reduced injuries, illnesses, and stress.

In addition, it was hypothesized that these effects would be mediated by organizational factors at each worksite (e.g., company size) and mediated by the personal characteristics of the coordinators who attended the REACH OUT Program (e.g., their prior
Figure 1. *Proposed model of the REACH OUT Training Program effects. SB198 = Senate Bill 198 (1989); org't = organizational.
levels of knowledge about Senate Bill 198 (1989) and scope of their Senate Bill 198-related responsibilities. On the basis of previous studies (e.g., Stuckler, Goodman, McLeay, Davis, & Koch, 1992), employees will also have been expected to benefit from the social climate they were exposed to, in terms of perceived social support and morale among employees. Companies with higher levels of social climate were expected to report better employee health outcomes.

Method

Participants

A sample of 150 Southern California small businesses was compiled by two methods: random and nonrandom sampling. First, to acquire a random sample of companies in Los Angeles County and Orange County, a randomly drawn list of 700 businesses was obtained from a survey mailing service. The 90 included companies were those identified under a Standard Industrial Classification code, number of employees ranging from 2 to 500, and geographic locations including Los Angeles and Orange Counties. Information about the study was sent to all 700 contacts on the list. Of those 700, 110 (or 16%) companies reached qualified participant interest forms to the research team indicating their willingness to become involved in the study. Of those 110, 90 completed the initial background questionnaire, yielding a response rate of 82% among businesses that initially expressed an interest in participating in the study. The randomly drawn sample.

To augment the number of companies participating in the study, the research team also obtained lists of businesses from two local chambers of commerce and sent participant interest forms and background questionnaires to companies on these lists. This procedure yielded an additional 25 background questionnaires. Also, public service announcements were presented on means of radio and newspapers, yielding 35 more questionnaires for a final sample size of 125.

Case Study Companies

Of the companies that participated in the workplace injury and illness prevention study, several volunteered on their participant interest forms to serve as case study companies. These companies agreed to have two on-site visits by members of the research team during the course of the study and to have their employees complete questionnaires on these two occasions. Twenty companies were selected from the 90 randomly sampled companies rather than from the nonrandomly sampled companies. These 20 companies were chosen because they had a "match"—another company that produced similar goods and services. The 10 pairs of companies represented (a) electronic device manufacturers, (b) metal fabrication, (c) plastics manufacturers, (d) clothing manufacturers, (e) paper-tobacco manufacturers, (f) grocery companies, (g) furniture, (h) automobile dealerships, (i) beauty services, and (j) recreational services.

Once the 10 pairs were selected, the companies were scored into two groups, each having one company from each pair and were roughly equivalent in terms of number of employees, location, industry type, and baseline compliance levels with Senate Bill 198 (1989). Once the two groups were termed, a size was drawn to determine which group would be designated the intervention group and which group would be the control group.

Procedure

Each case study company was visited twice by the research team: once approximately 3 months before the training session and again approximately 1 year after the initial visit. During these visits, the research team conducted a diagnostic walk-through of the facility to bring a checklist of proper safety signage, personal protection devices, general work environment, fire safety, electrical-mechanical safety, hazardous substances, ergonomics, employee training, and the company's injury and illness prevention program. To record examples of regulatory compliance and reenrollment, the team took photographs during the walk-through. Also, each company's Cal-OSHA Log 200 and worker's compensation annual summaries were collected to ascertain the number, type, and cost of employee injuries. Records of company safety meetings were also gathered. Additionally, if the company was given approximately 50 employee surveys to be distributed to and completed by the employees. In companies with fewer than 50 employees, the contact person was asked to give each employee a survey. In companies with fewer than 50 employees, the contact person was asked to give each employee a survey. In companies with fewer than 50 employees, the contact person was asked to give each employee a survey.

After the baseline data collection, all intervention companies were invited to attend one of three REACH OUT Training workshops held at locations in Orange County and Los Angeles. Fifty-six companies participated in the workshops. The 20 case study companies were visited again by members of the research team, to assess, to what extent, the worker's health and safety training program 2 of the 20 original case study companies, only 8 case study companies were used in the analyses. Two control companies elected to withdraw from the study and were included in the 200 companies who completed the negative surveys. These treatment companies completed the control group's survey, and, in addition, were asked to complete the REACH OUT Training Program 2 of the 200 companies who completed the negative surveys. The 4 companies were asked to complete the REACH OUT Training Program 2 of the 200 companies who completed the negative surveys. The 4 companies were asked to complete the REACH OUT Training Program 2 of the 200 companies who completed the negative surveys. The 4 companies were asked to complete the REACH OUT Training Program 2 of the 200 companies who completed the negative surveys.
SPECIAL SECTION: REACH OUT—CASE STUDIES

1 The research team decided that if the contact persons who attended the training program left their companies during the study, the new contact persons' data would be included in the analyses because they had not received the training during the incubation period.

2 The 13 items on the employee compliance scale are "the company provides proper safety and health information and training," "employees know what to do in case of an emergency," and "enough safety signs are visible in the workplace."
Data Analyses

An earlier, previously reported results of the larger study indicated that the REACH OUT intervention program increased corporate compliance with the legislation. The authors predicted that this increased corporate compliance would improve employees' perceptions of health and safety outcomes. To determine whether there were any direct effects of the REACH OUT Training Program on the employments' perceptions of health and safety outcomes, employee health and safety outcomes were examined for differences by participation in the REACH OUT Training Program, controlling for the Time 1 scores. A fifth series of ANOVAs examined the effects of corporate compliance on employee health and safety outcomes at Time 2, controlling for the Time 1 outcomes. To test the hypothesis that enforceable social norms is associated with improved employee health outcomes, we performed a sixth series of ANOVAs to examine all employee outcomes at Time 2, controlling for the Time 1 outcomes.

Results

The first series of ANOVAs examined the effects of corporate compliance (as assessed by workplace health and safety coordinators) on employees' perceptions of health and safety meetings and training sessions revealed that employees in companies with greater corporate compliance perceived an increase in the number of meetings, F(1, 7) = 9.52, p < .05, and training sessions, F(1, 7) = 8.17, p < .05, when Time 1 measures, and scores of the coordinator's Senate Bill 198-related responsibilities were controlled for (see Table 1). When company size was also controlled for, employees in companies with greater corporate compliance still perceived increased training sessions, F(1, 7) = 15.12, p < .03, but not increased meetings.

The second series of ANOVAs revealed that as measured by the Physical Health Symptoms scale (Globerd et al., 1990), the about health instrument, and the Global Stress Scale (Coleman et al., 1988), was analyzed by the Health outcomes. A fourth series of ANOVAs was performed to determine whether there were any direct effects of the REACH OUT Training Program on the employees' perceptions of health and safety outcomes, controlling for the Time 1 measures of employee health outcomes.

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Table 1

<table>
<thead>
<tr>
<th>Perceptions of corporate compliance</th>
<th>Perceptions of meetings</th>
<th>Perceptions of training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>130.40</td>
<td>22.22</td>
</tr>
<tr>
<td>High</td>
<td>189.87</td>
<td>37.04</td>
</tr>
<tr>
<td>SD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Controlling for Time 1 measures of perceptions and scores of the coordinator's Senate Bill 198-related responsibilities. Median splits were performed on employees' perceptions of compliance. Perceptions of meetings and training sessions measured as hours per month spent in meetings and training sessions by ORS. The unit of analysis is the company rather than the individual employee. Accordingly, mean scores reflect the average scores for all employees at each company. These results represent the significant effects found when the unit of analysis is the individual employee rather than the company. *F(1, 7) = 9.50, p < .05. **F(1, 7) = 8.17, p < .05.
Table 2

<table>
<thead>
<tr>
<th>Perceptions of meetings</th>
<th>Access to ear plugsa</th>
<th>Access to proper lifting instructionsa</th>
<th>Assessments of complianceb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>High</td>
<td>61</td>
<td>.97</td>
<td>.08</td>
</tr>
</tbody>
</table>

Note: Median splits were performed on employees' perceptions of meetings. Access to ear plugs and proper lifting instructions were measured on a scale with response ranges from 0 to 100 (low compliance) to 100 (high compliance). The degree of freedom for each F test reflects the fact that the data were collected over time (e.g., access to ear plugs and access to proper lifting instructions were not released to the employees at all companies). Nonparametric tests were used as missing data. *F(1, 48) = 7.54, p < .01. #F(1, 99) = 4.13, p < .05. *F(1, 93) = 7.96, p < .01.

employees' perceptions of health and safety meetings and training sessions increased, employee health and safety knowledge increased (see Table 2). Specifically, as perceptions of meetings increased, so did perceptions of access to ear plugs. F(1, 48) = 7.54, p < .01, perceptions of access to proper lifting instructions, F(1, 99) = 4.13, p < .05, and employee assessments of corporate legislative compliance, F(1, 92) = 7.96, p < .01. Also, as perceptions of training sessions increased, employee assessments of corporate legislative compliance increased. F(1, 93) = 11.95, p < .001, and physical health symptoms decreased, F(1, 93) = 5.58, p < .02.

The third series of ANOVAs examining employee health outcomes by employee health and safety knowledge revealed that stress was positively associated with greater perceptions of access to goggle/ear plugs, F(1, 95) = 5.58, p < .02 (see Table 3). Reduced injuries was predicted by perceived access to a lunch area away from toxins, F(1, 70) = 5.63, p < .02.

The fourth series of ANOVAs examining all of the employee variables' perceptions of safety meetings and training sessions, employee health and safety knowledge, and employee health by intervention revealed that employees in the training group had fewer illnesses, F(1, 89) = 7.55, p < .01, and greater perceptions of access to protective devices such as hard hats, F(1, 18) = 22.73, p < .001, and hair nets, F(1, 21) = 17.35, p < .001, than employees in the nontraining group (see Table 4). The fifth series of ANOVAs examining the interactive effects of the intervention and company size on employee-level outcomes again indicated that the training group had fewer illnesses, F(1, 89) = 7.39, p < .01, and greater perceptions of access to hard hats, F(1, 18) = 27.78, p < .001, and hair nets, F(1, 43) = 10.7, p < .001, than the nontraining

Table 3

<table>
<thead>
<tr>
<th>Perceptions of training</th>
<th>Assessments of compliancec</th>
<th>Physical health symptomsd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>High</td>
<td>43</td>
<td>9.47</td>
</tr>
</tbody>
</table>

Note: Median splits were performed on employees' perceptions of training sessions. Assessments of compliance were measured on a scale with response ranges from 0 (low compliance) to 100 (high compliance). Physical symptoms measured on the Physical Health Symptoms scale ranged from 10 (no symptoms) to 50 (max symptoms). #F(1, 92) = 13.95, p < .001. *F(1, 93) = 5.58, p < .02.
group. In addition, there was an interaction: In the nontraining group illnesses increased as company size increased, but in the training group, illnesses decreased as company size increased, F(1, 89) = 3.96, p < .05.

A sixth series of ANOVAs examining the effects of the intervention and social climate on employee outcomes indicated that employees in the training group not only had fewer illnesses, F(1, 89) = 9.25, p < .001, and greater perceptions of access to hard hats, F(1, 18) = 22.81, p < .001, and hair nets, F(1, 20) = 15.64, p < .001, than those in the nontraining group, but they also experienced less stress, F(1, 38) = 4.60, p < .04, when social climate and Time 1 measures of stress were entered as covariates.

Discussion

The findings of this study support the hypothesized linkages outlined in the proposed model (see Figure 1). The results indicate that employees of companies in greater compliance with Senate Bill 198 (1989) perceived more health and safety meetings and training sessions. Moreover, increased health and safety meetings and training sessions were associated with improved employee health and safety knowledge as well as improved employee health outcomes.

The results also indicate direct linkages between coordinator participation in the REACH OUT Training Program and employee outcomes. Employees whose company had participated in the Program reported fewer illnesses, greater perceptions of access to personal protective devices, and lower levels of stress than nonparticipants, after controlling for preintervention levels of these variables. These findings are important because they reveal direct linkages between corporate participation in the REACH OUT Training Program and employee-level health outcomes.

Another interesting finding was the interaction between intervention and company size on number of reported illnesses. In the control group, as company size increased, illnesses increased. This supports earlier data from this study indicating that the number of injuries and illnesses is a function of company size (Stokes et al., 1995). However, in the intervention group, as company size increased, illnesses decreased. This finding may indicate that once companies have the knowledge to implement an effective IPP, larger companies will be more capable than smaller companies, because of differences in resources, of implementing an IPP and, perhaps, reducing illnesses.

The findings also revealed that stress was positively associated with perceptions of access to personal protective devices and ear plugs. These findings suggest that occupations that are hazardous and require use of these protective devices may be especially stressful.

Although the findings of this study are significant, they should be interpreted cautiously in light of certain methodological limitations. The response rate was lower than expected, and the sample was not completely random because we used a combination of random and nonrandom sampling techniques to identify our final list of participating companies. Moreover, the research team could not ascertain that those who chose to participate in the study were not significantly different from those who did not. The participating companies may have been more aware of and, perhaps, in greater compliance with Senate Bill 198 than those who did not participate. Also, except for the researchers' on-site observations of corporate compliance, there was a lack of nonsubject-
tive indicators of the intervention effects. Although the research team attempted to collect Cal OSHA logs, injury reports, and workers’ compensation data, many companies were unable to provide this information, and the data that were provided were often difficult to use because of variations in reporting format. Future research should take steps to ensure and examine more objective employee data. A final limitation of the study is the lack of a true-gained causal model that explicitly accounts for the relationshhips between all of the variables considered.

It should also be noted that these findings are of limited generalizability to larger companies. Most companies that participated in this study employed between 50 and 100 employees. In fact, companies of the size were targeted for the study because of their general lack of regulatory compliance. As national survey data have shown, large and small companies have very different levels of resources and, therefore, very different capabilities in terms of providing organizational and employee services. In view of these differences, it must be reiterated that in this study we examined the effects of the REACH OUT Training Program on small companies, and the results cannot fully be generalized to larger companies.

At the same time, however, the above-noted limitations were partly offset by certain strengths of this research, including (a) the selection of the case study companies from the sampling frame provided by a survey research firm (rather than from among those businesses identified through nearerad sampling strategies), (b) the maintenance of comparable treatment and control companies within the case study sample, (c) the use of pre- and posttests and analyses controlling for preintervention levels of the major outcome variables. These methods may compensate for some of the study’s limitations.

The results of this study suggest several directions for future research on workers’ injury and illness prevention programs. At least earlier, two companies withdrew from the study because of insufficient time. Several companies withdrew from the larger study also citing insufficient time. This is consistent with previous research indicating that small businesses are hindered by lack of resources such as staff, time, and funding. For IPP programs to assist small businesses, they must be streamlined so that employers will consider them more feasible and effective. Future studies also should examine IPPs in the context of comprehensive workplace wellness programs. Comprehensive programs are being developed to incorporate occupational, health and safety, facilities management, health risk appraisal, clinical preventive services, organizational health, as well as organizational and regulatory compliance. Future research should examine the effectiveness of IPP programs within the context of these comprehensive programs.

The present study offers evidence for the effectiveness of the REACH OUT Training Program and suggests the value of a social-ecological approach to worker health promotion. This multidisciplinary approach—integrating social, ecology, risk communication, occupational health and safety, and workplace health promotion—combines both active and passive strategies of health promotion and emphasizes high impact organizational leverage points for health promotion. A comprehensive, ecological perspective should be applied consistently in the future to develop more effective health promotion programs in the workplace and in the larger community.

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Appendix

The REACH OUT Acronym for Requirements of Senate Bill 158 (1989)

Responsibility assignment
Evaluation procedure
Accident investigation
Corrective action
Hazard prevention training
Obeying the law
Understanding through communication
Teaching and record keeping

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