Management Support and Worksite Health Promotion Program Effectiveness

David M. DeJoy, Heather M. Bowen[1], Kristin M. Baker[1], Bethany H. Bynum[2], Mark G. Wilson[1], Ron Z. Goetzel[3], and Rod K. Dishman[4]

[1] The University of Georgia, College of Public Health, Department of Health Promotion and Behavior, Athens, Georgia 30602
{dmdejoy,hmbowen,kmbaker,mwilson}@uga.edu
[2] The University of Georgia, Franklin College of Arts and Sciences, Department of Psychology, Athens, Georgia 30602
bhhoff2@uga.edu
[3] Emory University, Rollins School of Public Health, Institute for Health and Productivity Studies, 4301 Conneticut Avenue, NW, Suite 330, Washington, DC 20008
Ron.Goetzel@thomsonreuters.com
[4] The University of Georgia, College of Education, Department of Kinesiology, Athens, Georgia 30602
rdishman@uga.edu

Abstract. The purpose of this paper is to describe the development and use of management support measures in two worksite health promotion intervention trials. Results from the two intervention trials suggest that management support for health promotion can be assessed and tracked over time using both perceptual and observational measures. These results also provide initial evidence that an increase in management support can contribute to positive changes in health related behaviors and outcomes. Specifically, longitudinal results from the two studies suggest that interventions designed to increase management support for health promotion resulted in changes in perceptions of management support, actual changes in the work and organizational environment. Preliminary results in these studies also suggest that increased management support is important in weight loss.

Keywords: health promotion, management support, organizational climate, workplace, worksite.

1 Introduction

Management support is typically viewed as a critical prerequisite to the success of workplace health promotion programming [5,23]. In our review of the relevant workplace literatures, we found that management support is frequently mentioned and discussed but seldom operationalized or measured. Published reports of workplace health promotion interventions often address the steps that were taken to gain or build management support, and such activities are sometimes viewed as key components of the intervention. Occasionally, informant interviews or other qualitative data are presented to gauge the extent to which management facilitated or impeded implementation, or the

B.-T. Karsh (Ed.): Ergonomics and Health Aspects, HCII 2009, LNCS 5624, pp. 13–22, 2009.
© Springer-Verlag Berlin Heidelberg 2009

general extent to which efforts to boost support were successful. Actual attempts to quantitatively assess or track management support across time or between treatment conditions are quite rare.

The basic idea of assessing management support intersects with the concept of organizational climate. Organizational climate has been defined as the shared perceptions held by members of an organization concerning the practices, procedures, and types of behaviors that get rewarded and supported in a particular setting [18]. In general, employee perceptions of management support play a key role in the formation of climate perceptions. Today, it is generally accepted that organizations have multiple climates rather than a single, all-inclusive climate. These so-called facet-specific climates may include climates for customer service, occupational safety, innovation, risk-taking, and so forth. The climate literature contains numerous studies and instruments assessing the climate for workplace safety, but very few assessing the climate for health promotion. Published reviews of safety climate research indicate that perceptions of management support/commitment are perhaps the single most dominant component of safety climate [9,12,15].

Ribisl and Reischl's [20] health climate questionnaire represents one of the few attempts to assess health-related climate factors within work organizations. Their instrument features 12 subscales. One of the subscales, "employer health orientation", provides a global assessment of management support for health promotion. More recently, Barrett and colleagues [1] developed an organizational leadership scale as part of the Alberta Health Project in Canada. This scale follows an organizational learning perspective, but is oriented more towards communities than workplaces.

The purpose of this paper is to describe the development and use of management support measures in two worksite health promotion intervention trials. Both of these trials included intervention components that were specifically directed at demonstrating management support. Both intervention packages were developed using social-ecological frameworks [4].

2 Worksite Physical Activity Trial

This study evaluated the efficacy of a social-ecological intervention delivered at the workplace to increase leisure-time physical activity. A group–randomized 12-week intervention consisting of organizational action and personal and team goal-setting was implemented with 1,442 employees at 16 worksites of a large national retailer [8]. Change in physical activity was analyzed using latent growth modeling (LGM) and latent transition analysis. Participants in the intervention had greater increases in moderate and vigorous physical activity and walking compared to participants in a health education control condition. The proportion of participants that met a public health recommendation for regular participation in either moderate or vigorous physical activity remained near 25% at control sites during the study but increased to 51% at intervention sites.

The organizational action component of the intervention consisted of ecologically-based environmental changes designed to integrate personal and environmental resources to promote physical activity. Specific components included: 1) senior management endorsement, 2) joint worker-management participation in program planning

and implementation through the establishment of a steering committee, 3) group and organizational goal-setting, and 4) environmental supports and prompts that publicized and facilitated physical activity. Group goal-setting was intended to promote social support, social networks, and competition, but these variables were not evaluated as mediators of the intervention.

We assessed participant perceptions of management support and employee involvement at three time points: baseline, mid-point of intervention, and at the end of the intervention period. Management support for employee physical activity was assessed using a five-item scale derived from the physical activity portion of Heart Check, a worksite health promotion assessment instrument [11]. This scale included items such as: "Management at my worksite directly supports my physical activity goals." Employee involvement was measured using a 4-item scale adapted from the high involvement work processes literature [22]. The scale was designed to capture the four components of PIRK framework of high involvement work processes: Power, Information, Rewards, and Knowledge [14], and feature items such as: "In general, employees at my worksite are actively involved in shaping practices, systems, or methods for enhancing greater physical activity and exercise while at work." Both measures used 5-point Likert-type scales ("strongly agree" to "strongly disagree") with a neutral midpoint. In the present sample, scores on each measure conformed to a single factor. Internal consistency (Cronbach α) was .92 to .94 for management support and .83 to .87 for employee involvement.

The LGM for management support provided acceptable fit to the data in the intervention and control groups. The fit of the LGM for employee involvement was good

Table 1. Means and standard deviations (SD) for perceived management support, employee involvement, and physical activity for control and treatment groups

	Measure		Time 1	Time 2	Time 3
Control	Perceived management support	Mean	3.16	3.13	3.05
		SD	0.93	0.92	0.96
	Employee involvement	Mean	2.74	2.92	2.94
		SD	0.78	1.08	0.99
	Physical activity (MET-minutes)	Mean	1552	1531	1848
		SD	1781	2002	2450
Treatment	Perceived management support	Mean	3.38	3.48	3.43
		SD	0.87	0.90	0.90
	Employee involvement	Mean	3.22	3.45	3.52
		SD	0.76	1.18	1.39
	Physical activity (MET-minutes)	Mean	1910	2562	2838
		SD	2294	2469	2811

in the intervention group but less acceptable in the control group. Groups did not differ on initial status ($p > .05$). There were linear increases in management support ($p < .05$) and employment involvement ($p < .001$) in the intervention group but a decrease in management support ($p < .05$) and no change in employment involvement in the control group. Results were not substantively different after adjustment for demographic variables.

In addition, management support and employee involvement were significantly correlated across all three time points (Time 1 $r = .464$, $p < .001$; Time 2 $r = .526$, $p < .001$; Time 3 $r = .571$, $p < .001$). Management support was significantly correlated with physical activity at all time points (Time 1 $r = .101$, $p = .003$; Time 2 $r = .114$, $p = .001$; Time 3 $r = .071$, $p = .05$). Finally, employee involvement and physical activity were significantly correlated but only at Time 1 ($r = .066$, $p = .05$). Table 1 contains treatment and control group means for each measurement period. Physical activity was assessed using the International Physical Activity Questionnaire (IPAQ) [14].

3 Worksite Weight Management Trial

This quasi-experimental cohort study was conducted with employees at nine treatment sites (n = 8,013) and three control sites (N = 2,269) of a major chemical manufacturing company. Again, following a social-ecological paradigm, two levels of intervention were designed to improve environmental and organizational supports for healthy eating and physical activity. The first level (moderate intensity) included a set of evidence-based environmental interventions (e.g., healthy vending options) that should be relatively easy and inexpensive to implement in a wide variety of work settings. The second level (high intensity) added in several additional components designed to reflect a high degree of management support for and engagement with weight management activities (worksite goal setting, reporting to senior management, etc.). The intervention period for this study was two years. As part of the formative research for this project [23], we developed two measures designed to assess different aspects of the management support: the LBE and the EAT.

3.1 The Leading by Example Questionnaire (LBE)

We sought to develop a brief, self-report instrument that could be used in two ways. The first use was to provide an overall global assessment of management support for health promotion within a variety of different types of workplaces. As such, a single administration of the LBE could be used to diagnose specific areas in which the health promotion climate might support or hinder programmatic efforts. The second use envisioned for the instrument was to assess or monitor change over time through repeated administrations.

In searching for a starting point for instrument development, we found the "Leading by Example" (LBE) questionnaire, which was developed by the Partnership for Prevention [17]. The questionnaire had been used as a descriptive/educational tool as part of the Partnership's broader Leading by Example initiative. With permission from the Partnership, we adopted their tool as the foundation for the current instrument. The original LBE provided a core of seven items directly related to management support,

commitment, and engagement. Additionally, new items were generated, critiqued, and revised by the research team through a series of team meetings and conference calls. The new items addressed topics such as health promotion goal setting and alignment, leadership training, communication, culture building, and financial and other supports for health promotion. All items, both old and new, were edited for use with employees of all educational levels. These items were measured using a five-point Likert scale, with a neutral midpoint ("strongly agree" to "strongly disagree").

The adapted questionnaire was pilot tested using a small sample of employees at one of the control sites participating in the larger intervention study. Then, as part of formative research activities for the larger intervention study, the draft LBE was administered to groups of employees at the other 11 sites participating in the study. Reliability and validity were assessed using a combination of exploratory and confirmatory factor analyses. This sequence of procedures produced a 13-item scale consisting of four subscales: business alignment with health promotion objectives (e.g., "Our site health promotion programs are aligned with our business goals"), awareness of the economics of health and productivity (e.g., "Employees at all levels are educated about the true cost of health care and its effects on business success"), worksite support for health promotion (e.g., "This site offers incentives for employees to stay healthy, reduce their high risk behaviors, and/or practice a healthy life style"), and leadership support for health promotion (e.g., "The organization provides our site leadership training on the importance of employee health"). A more detailed explanation of the psychometric procedures used to develop this measure can be found in Della et al. [7].

LBE data were collected at four time points (baseline, intervention year one, intervention year two, and post-intervention) and biometric and other outcomes were

Table 2. Means and standard deviations (SD) for LBE factor scores for control and intervention groups at baseline (B), intervention year one (I – Yr 1), intervention year two (I – Yr 2), and post-intervention (PI)

	Measure		B	I – Yr 1	I – Yr 2	PI
Control	Business alignment with health objectives	Mean	3.41	3.08	3.49	3.36
		SD	0.78	0.75	0.85	0.75
	Awareness of the economics of health	Mean	3.08	2.97	3.15	3.02
		SD	0.66	0.82	0.95	0.90
	Worksite support for health promotion	Mean	3.32	3.23	3.62	3.65
		SD	0.61	0.72	0.87	0.70
	Leadership support for health promotion	Mean	3.15	3.27	3.37	3.46
		SD	0.53	0.74	0.83	0.91
Intervention	Business alignment with health objectives	Mean	3.10	3.60	3.58	3.48
		SD	0.84	0.70	0.74	0.73
	Awareness of the economics of health	Mean	2.65	3.34	3.26	3.3
		SD	0.73	0.84	0.78	0.8
	Worksite support for health promotion	Mean	2.99	3.44	3.53	3.52
		SD	0.72	0.70	0.64	0.7
	Leadership support for health promotion	Mean	3.26	3.73	3.54	3.59
		SD	0.72	0.68	0.72	0.69

collected at three time points (baseline, mid-intervention, and post-intervention). The LBE factor-scores (see Table 2) reflected changes over time across intervention levels, particularly for the business alignment with health objectives factor ($p = .010$), awareness of health economics of health and productivity factor ($p = .060$), and worksite support for health promotion factor ($p = .085$). Changes in LBE factor scores were also related to the primary study outcome of weight loss, with a 6.4% increase in the prevalence of employees who lost or maintained their weight per point increase in the total LBE score ($p = .060$)

3.2 The Environmental Assessment Tool (EAT)

This measure is essentially an audit tool that can be used to assess workplace supports for healthy eating, weight management, and physical activity. The EAT was developed in three stages: contextual analysis and literature review, prototype development, and pilot testing [6]. The contextual analysis involved working cooperatively with corporate staff to become familiar with the specific work and operational environments and the broader site and location characteristics of the facilities participating in the project. The EAT integrated the physical characteristics of the worksite, features of the information environment, and characteristics of the immediate neighborhood around the workplace from the previously developed CHEW (Checklist of Health Promotion Environments at Worksites) instrument [16], as well as characteristics of employer and administrative support from the Heart Check instrument [11]. Questions for the EAT were developed around these concepts as they applied specifically to environmental physical activity and obesity management interventions. These questions addressed the job factors, physical and social-organizational work environment, and socio-cultural and economic/legal environment variables found in DeJoy and Southern's [4] social-ecological model for workplace environmental interventions.

The final EAT prototype consisted of two sections, one completed by site staff and the other by independent observers who toured the site and recorded their observations. The portion to be completed by site staff consisted of questions that could best be answered by those closely affiliated with the site, and included such topics as work rules and requirements, current health promotion programs and services, and formal policies that support or facilitate healthy eating and/or physical activity participation. The EAT instrument has three subscales, pertaining to 1) Physical Activity, 2) Nutrition and Weight Management, and 3) Organizational Characteristics and Support.

A 100-point scoring system was developed to permit quantitative comparisons of environmental supports across control and treatment sites and to monitor changes over time. A weighting exercise was performed to assess the relative importance of each component in terms of supporting nutrition and weight management and physical activity in the workplace context.

As with the LBE, EAT data were collected at four time points (baseline, intervention year one, intervention year two, and post-intervention). The EAT sub-scores (see Table 3) reflected the environmental changes implemented as part of the intervention. Intervention sites demonstrated significantly greater changes in EAT scores, from baseline to intervention year two, compared to control sites for the nutrition and weight

management ($\beta = 8.28$, $p = .012$) and organizational support ($\beta = 6.59$, $p = .010$) scales as well as the total EAT score ($\beta = 16.10$, $p = .002$). Changes in the total EAT scores were also related to the primary study outcome of weight loss, with a 0.4% increase in the prevalence of employees who lost weight per point increase in the total EAT score ($p = .013$). Changes in the EAT organizational support, physical activity, and nutrition and weight management scales demonstrated similar trends. Table 3 shows EAT sub-scores for each of the four measurement periods for the three treatment groups.

Table 3. Means for EAT sub-scales for control, moderate and intense treatment groups at baseline (B), intervention year one (I – Yr 1), intervention year two (I – Yr 2), and post-intervention (PI)

	Measure	B	I – Yr 1	I – Yr 2	PI
Control	Access to physical activity (32 possible points)	12.0	13.3	10.4	10.0
	Nutrition and weight management (32 possible points)	2.5	3.6	2.8	2.7
	Organizational characteristics and support (36 possible points)	21.0	15.0	17.0	14.0
Treatment	Access to physical activity (32 possible points)	9.3	10.4	11.4	12.4
	Nutrition and weight management (32 possible points)	8.7	15.9	14.5	18.9
	Organizational characteristics and support (36 possible points)	18.6	18.7	21.2	18.9

4 Discussion

At a very fundamental level, no worksite health promotion programming occurs without at least some basic level of support from management. After all, management sets the policies, determines goals and priorities, and allocates budget and other resources. The findings summarized in this paper suggest that the level of management support for health promotion can be assessed and tracked across time using both perceptual and observational measures. Brief questionnaires such as the LBE can be used to assess employee or stakeholder perceptions of management support. The factor or subscale scores from the LBE can be used to provide basic diagnostic information concerning the organization's strengths and weaknesses. Observational tools such as the EAT can be used to gauge the degree to which management support translates into work environments that support and reinforce positive health behaviors. Both types of measures can serve as process evaluation measures of implementation fidelity or as checks on the effectiveness of manipulations and, therefore, can be used to determine whether intended changes related to management support have actually occurred.

The longitudinal results from the two intervention studies suggest that interventions designed to reflect increased management support result in changes in employee perceptions of support, as well as actual changes in work and organizational

environments consistent with management support. These results also provide someinitial evidence that increased levels of management support can contribute to producing beneficial changes in health-related behaviors and outcomes. These results, however, are preliminary and more in depth and sophisticated analyses are clearly needed.

As argued at the beginning of this paper, management support for health promotion is a reflection of organizational climate. In the organizational behavior and management literatures, positive effects associated with increased management support have often been ascribed to a recalibration of the exchange relationship or the psychological contract, which exists between employers and employees [19, 21]. In simple terms, if your employer does more for you or otherwise demonstrates that you are valued by the organization, you are likely to reciprocate by expending more effort to help the organization reach its goals. This additional effort may extend beyond mere job performance and include other extra-role or citizenship behaviors. Citizenship behavior is not always completely altruistic, in that, some employees may see such behavior as a good way to increase their visibility within the organization or to impress their bosses with their initiative and team spirit [13]. Employee participation in health promotion programming itself fits the definition of organizational citizenship behavior. It is seldom a job requirement to participate in a worksite health promotion program. It follows, then, that demonstrations of management support may be quite important in boosting employee acceptance and participation in these programs.

Employers have a variety of motives for offering health promotion programs to their employees, including cost containment, productivity enhancement, absenteeism reduction, and improved recruitment and retention. Offering a health promotion program to employees is, by itself, a reflection of some level of management support for the health and well-being of the workforce. But how well this message is conveyed depends on the extent to which the message is consistent with other messages in the organization. A health promotion program is basically a human resource management (HRM) strategy and part of the organization's overall HRM system. Broad-based employee acceptance of health promotion efforts will likely depend on the extent to which the health promotion initiative is perceived as being congruent with other components of the overall HRM system. Employees will perceive enhanced management support for health promotion and respond appropriately only if this message is consistent with other messages and sources of evidence at their disposal [21,2]. In creating an organizational climate that values good health practices, there must be consistency in messages and the various HRM programs and practices should complement each other and make logical sense to employees. Too often, the health promotion message within organizations is fragmented, indistinct, and largely inconsistent with other apparent priorities. A strong climate for health promotion will exist when there is a high level of agreement among employees that health promotion is important and supported by the organization.

Acknowledgments

Preparation of this paper was supported in part by grants from the Centers for Disease Control and the National Institutes of Health.

References

1. Barrett, L., Plotnikoff, R.C., Raine, K., Anderson, D.: Development of measures of organizational leadership for health promotion. Health Edu. and Behav. 32, 195–207 (2005)
2. Bowen, D.E., Ostroff, C.: Understanding HRM- firm performance linkages: The role of the "strength" of the HRM system. Acad. Manage. Rev. 29, 203–221 (2004)
3. Craig, C.L., Marshall, A.L., Sjöström, M., Bauman, A.E., Booth, M.L., Ainsworth, B.E., Pratt, M., Ekelund, U., Yngve, A., Sallis, J.F., Oja, P., the IPAQ Consensus Group and the IPAQ Reliability and Validity Study Group: International Physical Activity Questionnaire (IPAQ): 12-country reliability and validity. Med. Sci. Sport Exer. 35, 1381–1395 (2003)
4. DeJoy, D.M., Southern, D.J.: An integrative perspective on worksite health promotion. J. Occup. Med. 35, 1221–1230 (1993)
5. DeJoy, D.M., Wilson, M.G.: Organizational health promotion: Broadening the horizon of workplace health promotion. Am. J. Health Promot. 17, 337–341 (2003)
6. DeJoy, D.M., Wilson, M.G., Goetzel, R.Z., Ozminkowski, R.J., Wang, S., Baker, K.M., Bowen, H.M., Tully, K.J.: Development of the environmental assessment tool (EAT) to measure organizational physical and social support for worksite obesity prevention programs. J. Occup. Environ. Med. 50, 126–137 (2008)
7. Della, L.J., DeJoy, D.M., Goetzel, R.Z., Ozminkowski, R.J., Wilson, M.: Assessing management support for worksite health promotion: Psychometric analysis of the Leading by Example instrument. Am. J. Health Promot. 22, 359–367 (2008)
8. Dishman, R.K., DeJoy, D.M., Wilson, M.G., Vandenberg, R.J.: Move to improve: A randomized trial to increase physical activity. Am. J. Prev. Med. 36, 133–141 (2009)
9. Flin, R., Mearns, K., O'Connor, P., Bryden, R.: Measuring safety climate: Identifying the common features. Safety Sci. 34, 177–192 (2000)
10. Goetzel, R.Z., Schechter, D., Ozminkowski, R.J., Marmet, P.F., Tabrizi, M.J., Roemer, E.C.: Promising practices in employer health and productivity management efforts: Findings from a benchmarking study. J. Occup. Environ. Med. 49, 111–130 (2007)
11. Golaszewski, T., Fisher, B.: Heart Check: The development and evolution of an organizational assessment of support for employee heart health. Am. J. Health Promot. 17, 132–153 (2002)
12. Guldenmund, F.W.: The nature of safety culture: A review of theory and research. Safety Sci. 34, 215–257 (2000)
13. Kidder, D.L., Parks, J.M.: The good soldier: Who is s(he)? J. Organ. Behav. 22, 939–959 (2001)
14. Lawler III, E.E.: The ultimate advantage: Creating the high-involvement organization. Jossey-Bass, San Francisco (1992)
15. Neal, A., Griffin, M.A.: Safety climate and safety at work. In: Barling, J., Frone, M.R. (eds.) The psychology of workplace safety, pp. 15–34. American Psychological Association, Washington (2004)
16. Oldenburg, B., Sallis, J., Harris, D., Owen, N.: Checklist of health promotion environments at worksites (CHEW): Development and measurement characteristics. Am. J. Health Promot. 16, 288–299 (2002)
17. Partnership for Prevention.: Leading by example: Improving the bottom line through a high performance, less costly workforce. Author. Washington, DC (2004)
18. Reichers, A.E., Schneider, B.: Climate and culture: an evolution of constructs. In: Schneider, B. (ed.) Organizational climate and culture, pp. 5–39. Jossey-Bass, San Francisco (1990)

19. Rhoades, L., Eisenberger, R.: Perceived organizational support: A review of the literature. J. Appl. Psychol. 87, 698–714 (2002)
20. Ribisl, K.M., Reischl, T.M.: Measuring the climate for health in organizations: Development of the worksite health climate scales. J. Occup. Med. 35, 812–824 (1993)
21. Roussseau, D.M.: Psychological contracts in organizations: Understanding written and unwritten agreements. Sage Publications, Thousand Oaks (1995)
22. Vandenberg, R.J., Richardson, H.A., Eastman, L.J.: The impact of high involvement work processes on organizational effectiveness. Group Organ. Manage. 24, 300–339 (1999)
23. Wilson, M.G., Goetzel, R.Z., Ozminkowski, R.J., DeJoy, D.M., Della, L., Chung Roemer, E., Schneider, J.H., Tully, K.J., White, J.M., Baase, C.M.: Using formative research to develop environmental and ecological interventions to address overweight and obesity. Obesity 15(suppl.), 37–47 (2007)