FEASIBILITY OF EMPLOYEE ASSISTANCE PROGRAMS IN THE COAL MINING INDUSTRY

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INTRODUCTION

Employee Assistant Programs (EAP's) are personnel programs that are designed to assist employees who have off-the-job problems that negatively affect on-the-job performance. Some programs focus primarily on substance abuse, while others deal with a wide range of problem areas. Today there are more than 5,000 programs operating in all types of organizations. However, until recently very few programs were operating in the mining industry.

Reasons for the scarcity of these programs in the mining industry were unclear, since both labor and management in other industrial settings generally endorsed and supported Employee Assistance Programs as effective means for dealing with substance abuse and personal problems that were negatively affecting job performance.

In 1980, the Bureau funded a six-year research effort to determine the feasibility of utilizing employee assistance programs in the underground coal mining industry. This study evaluated the effectiveness of one mining EAP program, the HELP Program, which by the end of the study had been operating 10 years in the Price, Utah area. In addition, 17 mining companies participated in the study by providing 26 mines as research sites, where relevant data was collected from miners, first line supervisors, and mine superintendents.

Prevalence of miners' off-the-job problems was ascertained, through interviews, as were estimates of the degree to which these problems affected on-the-job performance. In addition, prevalence data was collected from local physicians in mining communities.

A comprehensive model was utilized to evaluate the effectiveness of the HELP program located in the Price, Utah area. Resources committed to the program, processes such as treatment and referral, and outcomes were evaluated. Outcome variables included absenteeism, turnover, accidents on the job, accidents off the job, grievances, lost productivity, and workers' beliefs and attitudes toward the EAP program.

Results of the study indicate that both management and miners favor the concept of employee assistance programs. Prevalence data show that from 1% to 3% of the work force may have off-the-job problems that could seriously affect on-the-job performance. These data also indicate that family/marital, emotional and legal/financial problems are as prominent in the work force as is substance abuse.

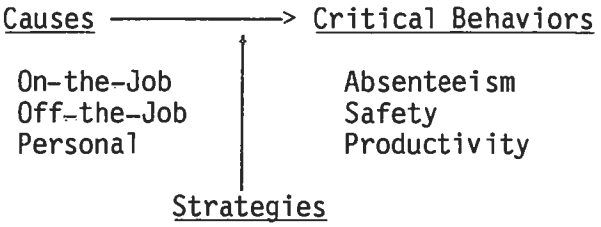
Evaluation of the HELP program indicates that significant numbers of miners and their families continue to utilize the program after ten years of operation. Evidence concerning the program's effectiveness was not clear-cut. During the period of evaluation, the mines participating in the HELP program experienced decreased demand for coal, and the work force was therefore reduced significantly. This fact made it virtually impossible to determine the program's effectiveness in reducing accidents, turnover, and absenteeism.

EMPIRICAL STUDIES

Two empirical studies were conducted to examine the feasibility of EAP's in mining. The goal of the first study was to assess the need for EAP's by measuring the prevalence of the types of off-the-job problems EAP's are designed to address, and the negative effects, if any, of these problems. The second study evaluated the effectiveness of the longest continuously running EAP in mining, the HELP program.

The conceptual framework for these studies is based on a model containing three classes of variables: critical behaviors, causes, and strategies. Critical behaviors are job-related activities that have important consequences for the organization. These include absenteeism, safety, and productivity. At the level of the individual worker, the causes of the critical behaviors can be classified as originating on the job, off the job, or within the person. Strategies for improving the critical behaviors operate primarily by affecting the behaviors' causes (see Figure 1).

Figure 1. Conceptual model of causes and strategies for improving critical behaviors.



According to the conceptual model, different causes of critical behaviors call for different strategies. Using an EAP is primarily a strategy for improving the critical behaviors by addressing off-the-job problems. Therefore, it is crucial to identify the extent to which off-the-job problems occur in the mining industry, and to establish whether EAP's are an effective strategy. If EAP's are not effective, then alternative strategies such as improved selection methods, preventive medicine programs, flextime, or transportation programs may be more appropriate to the specific off-the-job problems encountered at a particular mine.

Problem prevalence and effects

Several off-the-job factors were identified which may affect the critical behaviors. They include problems with the worker's family, marriage, or finances, legal difficulties, and abuse of alcohol or other drugs. The purpose of this part of the study was to identify the prevalence of these factors in the mining industry, and to assess whether these problems are viewed as having significant negative effects on the critical behaviors.

Methodology. There are a number of difficulties in measuring prevalence rates for problems that occur off the job. The social stigma attached to some types of problems, particularly alcoholism and drug abuse, reduces workers' willingness to talk about their problem or allow others to observe the symptoms. Many of these

problems are relatively rare, affecting perhaps 5% of the population, and casual observers may not notice any occurrences of the problem at all.

The strategy for obtaining good information about prevalence was twofold. First, the information was collected from sources likely to have first-hand knowledge of any problems. The second aspect of the collection strategy was to obtain prevalence data from several sources and to compare their reports to establish the convergent validity of their estimates. Therefore, detailed interviews were conducted with supervisors, superintendents, doctors from the mine community, and the miners themselves.

The data were collected from 26 underground coal mines in the eastern coal fields. Interviews with miners and supervisors were conducted underground during the working shift. Interviews with superintendents and community physicians were conducted in their offices. The interviews contained several questions about the frequency of off-the-job problems, and the respondent's appraisal of the relative effects of these problems on the three critical behaviors. Alcoholism and drug abuse have traditionally been the main focus of EAP's, so these problems were covered more extensively in the interview than the other types of problems. The design of the interview schedule and training of interviewers is treated in detail elsewhere (1).

Results. Physicians, superintendents, and supervisors were asked to estimate the "...percentage [of miners who] never drink alcoholic beverages, drink at least once a week, drink at least once a day, and drink more than once a day." Table 1 shows that there was a high degree of convergence in the estimates of the three groups. These data indicate that doctors, superintendents, and supervisors all agree that more than half of the miners drink at least once a week.

On-the-job drinking was assessed by questions in the superintendent and supervisor interviews that asked the percentages of miners who drink before, during, and after work. Their responses, summarized in table 2, indicate that on-the-job drinking is quite rare.

Table 1. Doctors', superintendents', and supervisors' estimates of drinking behavior.

% of miners who...	Doctors	Superintendents	Supervisors
Never drink	23	22	20
Drink once a week	62	54	56
Drink once a day	26	18	30
Drink more than once a day	8	15	N/A

Note: These numbers are averages of group percentage estimates and therefore do not necessarily total to 100%.

Table 2. Superintendents' and supervisors' estimates of time of drinking

% of miners who drink...	Superintendents	Supervisors
before work	6	9
during work	1	1
after work	20	36

Drinking and drug use might not matter if they caused no physical or mental impairment on the job. A series of questions assessed supervisors' and superintendents' experiences with drug- and alcohol-related impairments. Table 3 shows that most of the respondents have observed alcohol-related impairments at least once a year, and many were aware of drug-related impairments.

Finally, an estimate of the absolute prevalence of different types of off-the-job problems was obtained from the

Table 3. Estimated drug and alcohol impairment (% saying "yes, at least once a year").

	Superintendents	Supervisors
Alcohol		
Drank on the job	8	6
Came to work hung over	100	79
Came to work a little drunk	67	59
Came to work very drunk	17	3
Came to work too hung over or too drunk to work	50	56
Drugs		
Used illegal drugs on the job	30	15
Came to work showing the effects of illegal drugs	64	40
Came to work greatly under the influence of illegal drugs; unable to do the job adequately	27	16
Came to work greatly under the influence of legal drugs; unable to do the job adequately	50	12

miners themselves. As part of the detailed interview, miners were asked how many miners at their mine had their performance negatively affected by alcohol, drugs, family or marital problems, emotional problems, and legal or financial problems. Table 4 summarizes their responses in terms of mine-by-mine averages. The lowest prevalence rate was a .03% average at one mine for emotional problems, while the highest mine average was 8.41% for legal and financial problems at another mine. The overall averages indicate that prevalence rates for each of the types of off-the-job problems varies significantly from one mine to the next, as shown by the standard deviations and ranges.

Table 4. Miners' estimates of the frequency of off the job problems (during the last year).

Type of Problem	Mean	SD	Minimum	Maximum
Alcohol	1.11	0.90	0.18	3.32
Drugs	1.58	1.78	0.09	7.88
Family/ Marital	2.32	1.34	0.28	5.56
Emotional	1.42	1.79	0.03	8.14
Legal/ Financial	2.01	2.05	0.14	8.41

Discussion. The prevalence data indicate that off-the-job problems do sometimes affect miners on-the-job performance. However, these problems occur at a prevalence rate in the relatively low range of 1% to 3%. The variation in rates across mines indicates that different mines may need to employ different strategies to reduce their workforce's particular mix of off-the-job problems.

Evaluation of the HELP program

This study was designed to describe and measure the performance of an existing, long-term implementation of an EAP in mining. The HELP program was selected because it is perhaps the largest and oldest mining EAP.

Methodology. Evaluating a complex program, such as an EAP, requires a systematic evaluation model. The model used in the this study analyzed the EAP in terms of its inputs, processes, and outcomes (2).

The inputs of an EAP are its clients, and measuring the input aspect of the EAP involves establishing how employees were made aware of and

appropriately matched to the EAP. Measurements of inputs included the pattern of utilization; whether one group used the EAP disproportionately more than another group. The penetration rate (4), or the percentage of employees who might need the EAP's services who actually use the EAP, also assesses the input performance of the program. A third input measure is the potential utilization rate, which is the percentage of employees who are aware of the EAP and the services it provides.

The process measures of the EAP were designed to assess the effectiveness of the EAP's services. These measures included formalization, education, training, and referrals. Formalization was measured in terms of how clearly the mine outlined its policies and procedures regarding the EAP. Education was measured in terms of how well these policies were communicated to the employees. The effectiveness of supervisors' training in how to identify problem cases and motivate employees to enter the EAP was assessed. Finally, the accuracy of the EAP's diagnosis and referrals to treatment agencies was also measured.

The EAP's main value to the organization is in terms of its outcomes. The evaluation study isolated several variables of interest, including absenteeism, turnover, accidents on and off the job, productivity, and grievances.

In addition to the input, process, and outcome variables, several important additional variables were measured. The impact of the EAP on individual workers was assessed by determining their beliefs and attitudes about themselves, their work, the company, and the EAP. Union and management support are essential to any undertaking as large and resource-consuming as an EAP, so this was also measured. Finally, the monetary cost of providing the EAP was estimated.

The evaluation study was conducted at four mines using the HELP program during 1980 to 1983. One of the mines was closed down for economic reasons during the main data collection drive, but some historical data was still available. The 3 remaining mines averaged total employment of 325. An average of 72 miners and 10 managers were interviewed at each mine. Also, mine records were used to track attendance, productivity, employment, and other historical variables. The EAP's records were used to track utilization and types of treated problems.

Results. Table 5 shows the numbers and percentages of the total work force who entered or were active in the HELP program over the 3 years of the study. Since most participants were only active in the program for a year, the two rows are highly correlated. The percentages in the columns for the two half-years (1980 and 1983) were adjusted to an estimate of a full year's utilization, by dividing by half the total number of employees. Thus, the utilization of the HELP program remained fairly consistent over the three years of the study. The small year-to-year fluctuations did not indicate any apparent trend or correlation with significant events.

Table 5. People entering or active in the HELP program, 1980-1983.

	6 mos. 1980	1981	1982	6 mos. 1983
Entering	71 (9.6%)[1]	137 (9.3%)	98 (6.6%)	54 (7.3%)
Active	71 (9.6%)	174 (11%)	137 (9.3%)	90 (12%)

[1]Numbers in parentheses are adjusted percentages of employees.

HELP program records indicate that the program was extensively used by employees' family members. Of the participants during the study, 41% were not mine employees. The HELP program has a "broad-brush" orientation that covers problems that often have implications for the miner's family. Hence, it is not surprising that the family members take advantage of these extended services.

The pattern of utilization between white and blue collar workers (one of the input criteria) was fairly even. 79% of the participants were hourly workers or their family members, which corresponds to the 8:2 ratio of hourly to management employees at the studied mines.

The types of problems treated by the HELP program are shown in table 6. The final problem diagnoses were determined either by the EAP staff or the agency to which the client was referred. Most (89%) of the clients had either marital, family, or emotional problems. The rates for alcohol and drug problems (4% and 3%, respectively) are of the same magnitude as the prevalence estimates detailed earlier, lending some additional support to the validity of the prevalence data. The numbers are not directly comparable, however, because percentages in Table 6 are based on numbers of treated EAP clients while the Table 4 percentages were based on numbers of employees.

Table 6. Types of problems treated according to final diagnosis.

Problem Type	Number of Cases	% of Cases
Alcohol	29	4
Drugs	10	3
Marital	155	35
Family	107	24
Emotional	133	30
Financial	9	2
Legal	3	1

The effectiveness of the HELP program's processes was assessed by determining the accuracy of employees' perceptions about the program, the amount of management and union support for the program, and opinions about the quality of the program's services. Most of the miners (72% to 92%, depending on the mine) knew of the HELP program's existence, and most accurately perceived that the services were limited to employees and their families. When asked about the specific problem types covered, 84% to 97% correctly identified alcohol, drug, marital/family, and emotional problems. Somewhat fewer miners correctly identified financial or legal problems as an area serviced by the EAP (38% to 70%, depending on the mine). This could explain the low rate (3%) of financial or legal problem diagnoses (see Table 6). A high percentage (90%) of the supervisors also were aware of the program's existence. The remaining 10% were probably not able to use the personnel management benefits of the EAP simply because they did not know the program existed.

Miners and supervisors were asked how much support the program received from the superintendent, supervisors, the union, and the miners themselves. Tables 7 and 8 indicate a large amount of support from the various program constituencies (Table 7 reports ranges of mine-by-mine averages, while Table 8, because of the small number of supervisors at each mine, contains overall averages). Miners, not surprisingly, felt that the union and their coworkers supported the EAP slightly more than did management. Supervisors, on the other hand, perceived that the greatest level of support came from their mine superintendent. It was rare for either group to feel that any of the constituencies were strongly negative about the EAP.

Miners had very positive opinions about the quality of the HELP program's services. Most (58% to 72%, depending on the mine) felt that their coworkers or family members had received excellent or well above average treatment. The few (6% to 13%) who had used the program themselves had more mixed opinions about their own treatment. The percentage of miners at each mine who felt their treatment was at least slightly above average ranged from 43 to 75. Those who felt their treatment was poor ranged from 0 to 14%.

Table 7. Miners' opinions of the support received for the HELP program (ranges of mine-by-mine response percentages).

Response	Superintendent	Supervisor	Union	Miners
Very positive	10-32	8-12	22-24	16-19
Positive	33-39	38-47	45-54	30-36
Slightly positive	20-22	29-35	16-23	26-37
Slightly negative	4-17	6-8	16-23	8-16
Negative	2-6	2-6	2-6	0-2
Very negative	0-6	4-4	0-2	0-5

Table 8. Supervisors' opinions of the support received for the HELP program (percentages of respondents).

Response	Superintendent	Mine Supervisor	Sect. Supervisor	Miners
Very positive	62	22	4	32
Positive	17	48	23	46
Slightly positive	17	30	50	23
Slightly negative	5	0	0	0
Negative	0	0	0	0
Very negative	0	0	0	0

The outcomes of the HELP program were measured in terms of absenteeism, accidents, and turnover. Productivity, although it is an important organizational outcome, was not measured because individual level of performance is not readily obtainable in mining.

Absenteeism data were gathered from the mines' attendance records. Separate indices were constructed for total absences, all absences except those due to illness or injury, unexcused absence, and excused absences. Detailed breakdowns were made to analyze miners' changes in attendance before, during,and after treatment. Presumably, effective treatment would result in improved attendance. However, the breakdowns revealed ambiguous patterns: sometimes attendance improved, sometimes it worsened, and often it seemed to stay the same. Since the numbers of participants and the numbers of absences are both small, even if true patterns existed, they would be difficult to detect.

Turnover can be both good and bad for an organization. Employees may leave and take valuable skills with them. On the other hand, workers can leave because their skills and motivations do not fit their current job. They can benefit themselves and the organization by seeking a better fit elsewhere. The EAP can function as relatively nonthreatening job placement service for these "misfit" workers.

Turnover data was obtained from company records and coded as either positive or negative (from the employee's point of view). During the three years of the study, 18% of the employees terminated. Of these terminations, 20% were positive in the sense that the employee found a better job outside of mining. Unfortunately, data were not available from before 1977 when the EAP was adopted, so there is no way to estimate the program's effect on turnover.

Accidents for employees participating in the EAP were traced before, during, and after their treatment. Accidents were even rarer than absences, so the few possible trends in the data were conflicting or ambiguous.

Grievances can potentially be a problem in mines where disciplinary action is common. EAP's can be used as an alternative to disciplinary action, thereby reducing the likelihood of a grievance. Also, an EAP that successfully reduces on-the-job

performance problems will subsequently diminish the necessity for any kind of action, punitive or therapeutic.

Coal mine productivity is only readily observable at the crew level. The production process is so interactive and cooperative that individual efforts are difficult to disaggregate from the crew total. An analysis of crew level productivity (3) showed that accidents and absenteeism both have significant negative effects on a crew's daily production. To the extent that an EAP reduces accidents and absenteeism, then, it should also improve productivity. The present study was not able to document the accident and absence effects of the HELP program,and did not assess individual productivity.

The costs of the program were minimal compared to other types of employee benefits (e.g., insurance). The flat rates paid by the mines during the study were $4.50 to $5.50 per employee per month. A full cost benefit analysis is impractical with the data available. The benefits could only be determined if the specific marginal impact of the EAP on production, absenteeism, accidents, and other cost-related outcomes could be assessed reliably. The data collected for this study were not sufficient to measure these benefits.

Follow-up. The HELP program offices were briefly revisited in 1986 to observe any long-term changes since the end of the 1980-1983 study period. The program had continued strongly, but at a reduced size. One of the original four mines had closed and withdrawn from the EAP. A new, smaller (100-employee) mine had joined the HELP program. Because of the one mine's withdrawal and layoffs at the other participating operations, the employee population served by the HELP program had shrunk from 1475 to 623. The program is funded through a fixed charge per employee, so it saw its revenue base shrink by half during this time.

The managers of the EAP adjusted to the reduced revenue by decreasing some of its services. They reduced their staff and cut a few peripheral services, such as parenting classes. Usage of the program, however, continued at rates similar to those observed during the early part of the study.

The participating mines all appear to be committed to continuing to use the EAP, ten years into their partnership. The only significant threat to the HELP program's long-term viability appears to be the economic situation faced by the participating mines. If the mines continue to stay in business and provide clients, the HELP program should survive indefinitely.

Discussion. The HELP program was evaluated in terms of its inputs, processes and outcomes. Mine employees were well informed about the program and used it extensively, indicating good input performance. The program's processes also received favorable ratings. Sufficient evidence was not available to determine the program's effects on outcomes such as absenteeism, turnover, accidents, and production. However, the employees and mines seemed satisfied enough with the EAP's performance to continue active participation throughout the program's ten-year history.

RECOMMENDATIONS AND DESIGN CONSIDERATIONS

EAP's come in all shapes and sizes, as do mining operations. Once a decision has been made to implement an EAP, several decisions need to be made to develop a good fit between the mine and its EAP.

Decision 1: Goals

The company should formally define what it hopes to achieve with the EAP. Common goals may include the improvement of attendance, production, safety, employee well-being, or any combination of these. One way to select appropriate goals is to identify problem areas. For instance, if a mine

has excellent attendance, then reducing absenteeism should not be an important goal of their EAP. Also, if employee well-being is considered an important goal in its own right (as it should be) then good performance in other areas (e.g., production) should not be a necessary criterion of EAP success.

Decision 2: Program scope

Scope refers to both population and types of problems an EAP covers. The HELP program, for instance, covered employees and their families, and was considered "broad-brush" because it covered many types of problems. Alternatively, a program could cover only employees or even a small group of employees. Also, rather than covering a "broad-brush" range of problems, the EAP could focus on just one, typically alcoholism. The evidence from the two reported studies in mining indicates, though, that a wide range of problems exist, and that these frequently involve family members. Thus, it seems appropriate to recommend the "broad-brush," whole-family scope of services for almost any mine.

Decision 3: Organization

The EAP can be designed in a number of ways. A single EAP can provide services for a single mine, a mining corporation, or a consortium of corporations. This decision should be guided primarily by mine size and geographic location. A mine level EAP is appropriate for an isolated large mine. Several nearby mines under the same mining company may share a corporate EAP, while many neighboring mines under different ownership may agree to use a consortium EAP.

EAP's can be run either by the company or an outside vendor. If the company wants an EAP, but doesn't want to get involved in its management, they can contract with an outside vendor who will provide all services for a standard fee. Alternatively, the company can set up an in-house group to provide all of the EAP services. A third option between these two extremes is for the company and vendor to split the services, perhaps by having diagnostic and referral personnel working for the mine, and the treatment staff being provided by the vendor.

Decision 4: Location

The EAP can be located at the mine or somewhere off the site. The main reasons for locating on site are to minimize the mine-to-EAP traveling time and use existing facilities, if available (e.g., a mine doctor's office. The off-site location is useful for maintaining client confidentiality and sharing facilities with other mines.

Decision 5: Union's role

Development of an EAP is usually either a management initiative or a joint effort between the union and management. Cooperation between the union and management is desirable because it can lead to high levels of acceptance of the resulting EAP policies.

Decision 6: The EAP and other policies

The implementation of an EAP has important ramifications for how a mine carries out its personnel policies. In particular, the EAP provides modified or alternative ways of dealing with absenteeism, turnover, drug and alcohol abuse, and performance problems. The existing policies need to be reviewed and, if necessary, modified. Also, medical services and benefits need to be reviewed because EAP clients often need medical help.

SUMMARY AND CONCLUSIONS

An EAP can be a valuable addition to a mine's human resource management system. The studies reported in this paper have shown that there is a low but important prevalence rate of off-the-job problems that harm on-the-job critical behaviors. Although the rates are in the range of 1% to 3%, even one instance of problem-induced/-impaired performance can cause an accident costing millions of dollars. Thus, a general need for EAP's has been

established.

The case study of the HELP program showed that the program was enthusiastically supported by both labor and management. It was used extensively by employees and their families, and continues to be a viable entity ten years after its creation. The study could not document any concrete improvements in production, turnover, attendance, or grievances, but the mine managers believed that it was effective in attaining the goals they had set for it.

Aside from more tangible advantages, EAP's provide a number of means of attaining several intangible goals. Referral to an EAP provides a nonthreatening way of dealing with employee problems. Supervisors are often known to ignore or deny employees' "personal" problems, because they are not socially comfortable with confronting the employee. EAP referral is less confrontational than traditional disciplinary methods, and is more effective than doing nothing.

EAP's are also viewed as valuable benefits by employees. The same problems that disrupt their job performance can also ruin their personal lives. The EAP can provide them and their families with a route to solving their problems that may not have been evident or available before. Miners are known to place a high value on their personal and family lives, so a mine that provides an EAP demonstrates that it can be responsive to its employees' needs and values.

REFERENCES

1. Goodman, P. S. Research to Determine the Feasibility of Utilizing Employee Assistance Programs for the Mining Industry (contract J0100069). BuMines OFR 73-86, 1986, 234 pp.; NTIS PB 86-227089.

2. Goodman, P. S., R. Atkin, and D. Schoorman. On the Demise of Organizational Effectiveness. Ch. in Organizational Effectiveness, ed. by K. Cameron and D. Whetten, 1982, pp. 266-301.

3. Goodman, P. S., and D. P. Leyden. Human Resource Management Skills and Coal Mine Productivity, Volume 2 (contract J0133924). BuMines OFR 98B-86, 1985, 78 pp; NTIS PB 87-138335.

4. Hitchcock, L. C., and Sanders, M. S. A Survey of Alcohol and Drug Abuse Programs in the Railroad Industry, Report No. FRA/OPPD-OR&D 76-283, Nov. 1986.

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