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Barren River District Health Department Health Education/Risk Reduction Demonstration Projects

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BARREN RIVER DISTRICT HEALTH DEPARTMENT
HEALTH EDUCATION/RISK REDUCTION
DEMONSTRATION PROJECTS

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Master of Science

by

Rebecca L. Bruce

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1983 Age-Adjusted Death Rates*
Total Population

Diseases of the Heart	188.5
Cerebrovascular Diseases	34.3
Malignant Neoplasms	132.3
Pneumonia and Influenza	11.2
Chronic Liver and Cirrhosis	10.4
Diabetes	9.8
Accidents	34.9
Suicide	11.7

* Per 100,000 population
Health United States 1984

TABLE 2

Healthy People
Five Major Health Goals

Healthy Infants
Healthy Children
Healthy Adolescents and Young Adults
Healthy Adults
Healthy Older Adults

Fifteen Priority Areas

Preventive Health Services:	Family Planning Pregnancy and Infant Care Immunizations Sexually Transmissible Diseases High Blood Pressure Control
Health Protection:	Toxic Agent Control Occupational Safety and Health Accidental Injury Control Fluoridation of Community Water Supplies Infectious Agent Control
Health Promotion:	Smoking Cessation Reducing Misuse of Alcohol and Drugs Improved Nutrition Exercise and Fitness Stress Control

Healthy People, DHEW, 1979

TABLE 3

Medical Self-Care Course
Meta-Analysis Data

Group			N	X	SD
1980–81		Pre Exp	21	22.00	4.36
		Post Exp	18	24.83	4.13
		Pre Control	40	22.15	3.06
		Post Control	31	20.48	4.27
1981–82	A.	Pre Exp	7	19.43	2.76
		Post Exp	7	25.00	2.16
		Pre Control	8	16.00	3.70
		Post Control	7	14.71	4.23
	B.	Pre Exp	15	19.73	3.26
		Post Exp	15	24.60	1.81
		Pre Control	15	18.75	3.77
		Post Control	16	19.69	3.34

TABLE 4

Smoking Cessation
Meta-Analysis Data

Group	N	Quit	Quit%
1984–85	46	15	33
1985–86	51	21	41
1986–87	27	11	41
1987–88	66	49	74
Total	190	96	51

BARREN RIVER DISTRICT HEALTH DEPARTMENT
HEALTH EDUCATION/RISK REDUCTION
DEMONSTRATION PROJECTS

Rebecca L. Bruce July 1989 62 pages

Directed by: C. Wayne Higgins, Thomas Nicholson, and Jimmie Price

Department of Health and Safety Western Kentucky University

In July 1980, the Barren River District Health Department (BRDHD), serving eight counties (combined population approximately 204,000) in Southcentral Kentucky, was selected as a demonstration site under the auspices of the federal Health Education Risk Reduction (HERR) Program. With continued HERR funding for eight years, the BRDHD developed several successful health promotion projects. Major components of these projects include: 1) community health promotion, which serves to identify high-risk groups in the community and provide them with health education–health promotion services, 2) school health education which included the development of a preschool health education curriculum, 3) teacher education workshop, which instructs primary and secondary public school teachers in health education methods, 4) smoking cessation, and 5) a large industrial wellness program. This study reports on an eight year program evaluation of the HERR demonstration. Overall, the program evaluation suggests an increase in health knowledge and some attitude and behavior change for many of the participants in BRDHD programs.

CHAPTER I

Introduction and Literature Review

In the past few decades, research has identified lifestyle as the single most important factor in preventing early death and disability in the United States. The major modern killers are degenerative diseases; among them heart disease, cancer, stroke, arteriosclerosis, hypertension, diabetes, along with accidents and suicide (Table 1). All have been linked to a number of lifestyle related risk factors and unhealthy living patterns.[1-3]

Scientific evidence has now demonstrated that whether or not a person will be healthy or sick, live a long life or die prematurely, is related to lifestyle choices and personal health habits. Behavioral risk factors which increase a person's risk of becoming ill or being injured include, but are not limited to, smoking, alcohol abuse and other drug abuse related behaviors, faulty diet, obesity, insufficient sleep and exercise, stress, poor mental health attitudes, and failure to use seat belts. These behavioral risk factors weave a complicated web producing an increased risk of disease and injury.[4-7]

The emerging consensus among scientists and health professionals is that health problems among the U.S. population are largely a matter of individual and social choice—and preventable. One of the first national emphasis on lifestyle as it relates to disease prevention was documented in the 1964 Surgeon General's Report on Smoking and Health. This report documented the association of smoking behavior with premature morbidity and mortality related cardiovascular disease and cancer.[8]

In 1979, a second report, Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention was released to support the theory that by making appropriate lifestyle choices individuals can enhance their quality of life. Another theme in this report was the importance of supportive and knowledgeable decision-makers in the area of health promotion and disease prevention. This report concluded, "It is the controllability of many risks—and often the significance of controlling even a few—that lies at the heart of disease prevention and health promotion."[9] If disease and disability result in large degree from careless or irresponsible behaviors, then good health should be an achievable goal, through effort and attention to health promoting behaviors and environment.

Better understanding of the causes of modern health problems has made one thing clear. Influencing people to adopt healthy patterns of living will yield far greater gains in health status for the coming generation than advances in medical technology. From an economic standpoint alone, preventive action for health is good medicine. Taking care of personal health translates into dollars saved and greater well-being for the nation as well as the individual. In the long run, disease prevention and health promotion saves people from premature death, saves money from being spent on premature morbidity, increases longevity, and improves the quality of life.[10-15]

In 1980, Promoting Health/Preventing Disease: Objectives for the Nation was published. This report established specific and measurable objectives for 15 priority areas to assist in accomplishing the five major health goals (Table 2) for the U.S. by 1990, as outlined in Healthy People.[16,17]

These goals and objectives provide both the public and private sectors with guidance needed to determine how they can assist in reaching these health goals through use of their available skills and resources.

As the nation prepares to accomplish these health goals, it must also be aware of the obstacles that may prevent or slow the progress toward this assignment. In Healthy People, the Surgeon General noted four main obstacles that will increase the challenge of this endeavor: social factors, individual attitudes, economics, and knowledge.[18]

Since this report, a midcourse review of its objectives was published in 1986. Data from this review indicates a higher public awareness of three lifestyle behaviors. Reductions in smoking, per capita alcohol consumption, and an increase usage of automobile seat belts have occurred. Due to this, the report notes reduced death rates from strokes, cirrhosis, and traffic accidents. Though many objectives are being accomplished, others need more time and a renewed effort to achieve their goals. Illicit drug abuse, weight control, control of violent behavior, pregnancy outcomes, teen pregnancy, and sexually transmitted diseases are major problem areas noted for further improvements.[19]

In an effort to assist state and local health agencies in planning and implementing health education activities, the Health Education-Risk Reduction (HERR) Grant program was established by Congress in 1979 under Section 1703(a) of the Public Health Service Act.[20] These grants encouraged participation and coordination of all agencies and organizations involved in health education programs to reduce the risk of premature morbidity and mortality due to lifestyle choices. In 1980, every state, Washington D.C., Puerto Rico, Guam, and the U.S. Virgin Islands were awarded a HERR grant. In addition, 165 local intervention projects were awarded. In 1981, following

the guidelines of the Omnibus Budget Reconciliation Act, the Federal Government combined the HERR program with eight other categories to form the Preventive Health Block Grant. This consolidation provided for a decrease in administrative costs and gave states more flexibility and responsibility in addressing their own needs.[21,22]

The HERR grant applications were judged on the basis of their organized community approach, need, target populations, specific measurable long-term and short-term objectives, process objectives, evaluation plan, budget, and budget justification. A program evaluation was required to ensure accountability and efficiency.[23-25]

The Barren River District Health Department

The Barren River District Health Department (BRDHD) serves eight predominantly rural counties in Southcentral Kentucky. It is governed by a District Board of Health who monitors the health department's compliance with local, state, and federal regulations and rules. The BRDHD provides a wide range of services including: environmental health, pediatric, prenatal, postnatal, home health care, general primary care, communicable and chronic disease prevention and control, and health education. The health department is responsible for the health of all its community residents, not just the medically indigent.

Due to its existing resources, affiliation with other community organizations, and a willingness to progress and expand, the BRDHD is an ideal agency to administer health promotion activities among a variety of community populations. A solid base of health professionals, resources, and community involvement provided this health department with advantageous criteria when Kentucky HERR grants were awarded.

Health Promotion Within the Barren River District

If supporting preventive health measures is a wise and cost effective policy nation-wide, it can be even more crucial in a state such as Kentucky, with its high poverty rate and limited resources to pay for medical care. Kentuckians have been shown to have a greater incidence of behaviors associated with health risk than the national average. Lifestyles, a 1982 study of behavioral risk factors among Kentucky adults by the Kentucky Department for Health Services, Health Education Unit, reported an unusually high prevalence of health risk factors.[26] Significant findings of the study, by order of prevalence, were:

- Kentuckians are at a high automobile accident risk due to failure to use seat belts. Sixty-three percent of the adult population seldom or never use seat belts, compared with 57.6% reported nationally.
- Kentucky has the highest rate of cigarette smoking in the nation among adult men (48.8%) and the second highest among men and women (37.7%). Nearly one million Kentuckians currently smoke.
- Approximately 25% of Kentuckians are obese (20% or more overweight), compared with a national average of 22.4%.
- Approximately 20% of Kentucky adults suffer from stress severe enough to interfere with daily functioning.
- Fifteen percent of Kentuckians are "binge" drinkers. This is defined as those who have drunk five or more drinks on one occasion, or more occasions in the previous month.
- Over 31% of adults lead a sedentary lifestyle (little or no physical activity from exercise, work, and recreation) compared with 11.1% on a national average. Forty-five percent of women and 31% of men reported never exercising.
- Other high risk factors, which were reported by less than 10% of the sample included high blood cholesterol, medically-diagnosed hypertension, driving while drinking, and chronic alcohol abuse.

The high prevalence of individual risk factors among Kentuckians compared to the national average only begins to give a picture of the true health impact addressed here. Fewer than 10% of the adult population in Kentucky exhibit only one or none of these risk factors, while fully 42% exhibit four or more behavioral risk factors. The health effects of individual

risk factors are cumulative and often magnified by the presence of other risk factors, and the benefits of changing even one risk factor can be dramatic.[27]

It is assumed that the prevalence of these damaging lifestyle behaviors is no less among residents of the Barren River District than the state as a whole. The 1986 Kentucky Vital Statistics Report indicated that in the Barren River District area, the four major causes of death were heart disease (37%), cancer (21%), cerebrovascular disease (9%), and accidents (6%). For younger residents up to age 34 accidents account for over 51% of deaths. Chronic lung disease, diabetes, arteriosclerosis, suicide, cirrhosis of the liver, and hypertension account for an additional 12.5% of area deaths.[28] Lifestyle habits are proven risk factors in each of these diseases. Consequently, public education and early diagnosis by screening could be expected to lead to reductions in the high costs of illness and injury—in dollars, suffering, and lives.

The unhealthy lifestyle behaviors described here are linked to more than premature or preventable deaths among Barren River area residents. They are also an important part of a cycle of social conditions: poverty, poor education, rural isolation, and physical disability, each of which tends to help perpetuate the others. The 1980 census revealed the following statistics about the Barren River District in comparison with the rest of the state. Sixty-five percent of this ten county district is classified as being rural, leaving an urban population of only 35%. This compares with a Kentucky urban population of 50.9% and a rural population of 49.1%. The attendant problems of rural isolation, such as poor transportation and a lack of necessary facilities, are major impediments to good health care in this area.[29]

In relation to state and national averages, the Barren River District is economically depressed, and severely so in several counties. From 1980

census figures, only two area counties, Simpson and Warren, have an average per capita income above that of Kentucky as a whole. Butler, Edmonson, Hart, and Monroe counties have per capita incomes below $5,500. The estimated percentage of the Barren River population below the poverty level is 25.9%, compared with 20.6% for the state.[30]

Educational levels similarly reveal the depressed condition of the district. According to the 1980 census 49,283 persons, almost 40% of the population aged 25 and over, have only an elementary school education. Only 27% have a high school diploma and 19.3% have completed some college work. The percentage of beginning 9th grade students who complete high school is below the state average in all but four of the district's 15 high schools. Also noteworthy is that eight of these schools have a higher percentage of economically deprived students than the state average.[31]

In the 1980s, the need for public health agencies to utilize resources to the maximum is more serious than ever before. Funds have never been more limited, and demand, in both quantity and variety of services, has increased enormously. The creation of district health departments has been effective in increasing efficiency in the delivery of medical services, yet districts have created new challenges for community education and health promotion because of the large geographical areas they must serve.

One strength in service delivery for the Barren River District Health Department has been its success with community education. Each year the BRDHD has taken a more aggressive role in health promotion, and in doing so, expanded service delivery or target population considerably. Unlike the provision of primary medical services, health promotion services know few income or social barriers. In general, citizens of all income levels can benefit from education about the most prevalent health problems and how one's

lifestyle can affect chances of avoiding premature death or disability. However, evidence suggests health promotion services seem to be most effective among more educated, higher social-economic individuals who are generally more concerned with health and more receptive to information about their health.[32]

The traditional means of educating and influencing residents of the service area to adopt lifestyle habits conducive to good health is through individual counseling in conjunction with clinic services. This one-on-one education, combined with appropriate literature, is probably the most effective means of imparting health knowledge and influencing behavior.[33,34] Its impact is lessened, however, by the limited number of residents who can be reached in this manner. The majority of residents in the community never visit the health department for medical services.

For this reason, the Barren River District Health Department applied for and received HERR grant funding in 1980 through 1988 to provide community-based health education/health promotion activities. The purpose of this study is to conduct an historical review and evaluation of the BRDHD's HERR projects.

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CHAPTER II

Methodology and Chronology of Program

The Barren River District Health Department HERR projects have addressed their health promotion mission through two avenues—small group educational activities, and behavior modification assistance aimed at affecting change in a single health behavior. Each project utilized the expertise of the BRDHD health education staff, and took advantage of existing relationships with providers and community organizations. Other criteria for choosing the projects were that each addressed needs which were not being adequately met by other providers in the community, and each used a combination of BRDHD and other local resources for achieving specified objectives.

The BRDHD HERR projects utilized a planning by objectives model which established quantifiable objectives for each component of the program and allowed for careful monitoring of each intervention. The BRDHD employed the PRECEDE framework[35] and modified versions of this procedure during program planning.

The planning process is an important and valuable task. During this phase, the need is defined, a target population is selected, factors which may help or deter the success of the intervention are identified, and the desired outcome is specified.

After the planning process was completed, learning/behavioral objectives were developed. These objectives were specific and measurable.

They defined what the participant should be able to do after the intervention in order to demonstrate the achievements of the program.[36, 37]

All tests and surveys were developed by the BRDHD with recommendations by the program consultants from the Department of Health and Safety at Western Kentucky University. The Centers for Disease Control provided resources for two surveys: the Student Health Information Survey and the Adult Health Information Survey. The data generated from each intervention were processed and analyzed by program consultants. The Statistical Package for Social Sciences (SPSS) computer program was utilized for data processing. Descriptive statistics were utilized with inferential statistics applied when appropriate. For the purpose of this study, meta-analysis is employed for two programs. "Meta-analysis is the name given to a set of techniques for reviewing research in which the data from different studies are statistically combined."[38] Two programs, Smoking Cessation and the Medical Self-Care Course, were replicated several times over the eight-year period. Although group size, instructors, geographical location, and classroom site have varied, the same curriculum guides and evaluation instruments were utilized. Applying the techniques of meta-analysis to these programs provides a stronger evaluation of the accomplishments of the program than any single year analysis.

At the end of each grant year, the program consultants prepared and submitted a formal evaluation of the BRDHD projects. These reports are on file at the BRDHD and with the Health Promotion Branch, Cabinet for Human Resources in Frankfort, Kentucky. Data was drawn from these reports for the purpose of this study's evaluation of the HERR programs. In a few cases, the reports did not contain all data needed to record statistical comparisons.

Since this study reviews an eight-year period and 39 programs involving 8,784 participants in several target populations and utilizes a variety of methodologies, a chronology is provided for reader convenience. See Appendix A for a description of the population served.

Chronology

HERR 1980–81

1) Minority Task Force Advisory Committee

The BRDHD provided a wellness workshop for 12 leaders of community-based organizations. A health attitude and behavior survey was administered before and after the workshop.

2) Head Start Children

The BRDHD completed the following:

- developed a comprehensive health education curriculum based on the Health Education Curricular Progression Chart designed by the National Center for Health Education.
- trained 13 Southern Kentucky Head Start teachers and four staff members to teach and evaluate the curriculum.
- developed an evaluation plan for the Head Start health education intervention.

3) Day Treatment for Juvenile Offenders

The BRDHD developed and implemented a 28 hour health education program for 21 juvenile offenders. Pre/post health knowledge tests and health attitude/behavior questionnaires were administered to 19 experimental and 18 control group participants. The control group was selected from a similar program for juvenile offenders located in Elizabethtown, Kentucky. Both of these treatment programs serve under the auspices of the Kentucky Cabinet for Human Resources, Mental Health Department.

In addition, a six month follow-up was conducted using the same attitude/behavior survey on experimental and control groups.

4) Elementary School Teachers

A curriculum was developed and implemented for 33 teachers emphasizing techniques for teaching health education to elementary school students. The main goal of this program was to help teachers feel more competent to teach health education and increase its use in the classroom.

Twenty-nine participants were surveyed before the workshop with six month and one year follow-ups. Teacher observations, oral examinations, and written examinations were used to evaluate program objectives.

The BRDHD contracted with the Department of Health and Safety at Western Kentucky University to conduct this workshop as a three hour graduate course held during its summer session. Stipends were awarded to workshop participants to help defray course enrollment fees.

5) Community Health Risk Factor Prevalence Survey

The BRDHD conducted a telephone survey of 500 adult (18 yrs. and over) residents in the Bowling Green/Warren County area.

A computer-selected, random sample of phone numbers was obtained with the assistance of the Computation Center of Western Kentucky University. The city telephone directory was used as the sampling frame. The telephone interviews were conducted by health department staff.

The sample was not representative with regard to sex or income of the community. The fact that many calls were made during hours when women were more likely to be at home or the tendency for women to be more likely to cooperate may explain the high percentage of female responses.

The project also recognized that using the telephone directory as a sampling frame excludes individuals without phones and those with unlisted numbers.

6) Medical Self-Care Course

The BRDHD conducted a 16 session medical self-care course to 21 community participants. The group was administered a pre/post health knowledge test and an attitude/behavior questionnaire. The experimental group chose someone they knew to serve in the control group. Procedures for not sharing course information with the control group were discussed and agreed upon.

HERR 1981-82

1) Minority Task Force Advisory Committee

A one-time workshop was conducted for area community leaders who work with a minority population. Due to small numbers of participants as well as lack of interest in being evaluated, an evaluation of the program was not conducted.

2) Head Start Children

The BRDHD conducted a pilot study on 40 four- and five-year old children to test the health education curriculum and evaluation instruments developed the previous year.

The day care selected for the pilot study served minority and low-income populations. This is the same population served by Head Start. The main difference in the Head Start and day care programs was the inclusion of prayer and Bible study in the private day care program.

After the pilot study, the BRDHD provided the curriculum to 73 children enrolled at the High Street Head Start program in Bowling Green, Kentucky. Thirty-five students enrolled at the Russellville, Kentucky, Head Start Center served as controls for the program evaluation.

A pre/post test design was incorporated to determine the effect of the six month curriculum on the four- and five-year old children's health knowledge.

3) Medical Self-Care Course

The BRDHD conducted two 16 session courses for: 1) seven Head Start mothers and 2) 15 community participants. The groups were administered a pre/post health knowledge test and an attitude/behavior questionnaire. The experimental groups chose someone they knew to serve in the control groups. Procedures for not sharing course information with the control group were discussed and agreed upon.

4) Day Treatment Program for Juvenile Offenders

The BRDHD conducted a 30 hour health education course for 14 juvenile offenders enrolled at the Bowling Green Day Treatment Center. Pre/post health knowledge tests and health attitude/behavior questionnaires were administered to 14 experimental and 16 control group participants. The control group was selected based on it being the same type of treatment program for juvenile offenders located in Elizabethtown, Kentucky. Both of these treatment programs serve under the auspices of the Kentucky Cabinet for Human Resources, Mental Health Department.

5) Elementary School Teachers

A workshop was conducted for 36 elementary school teachers emphasizing techniques for teaching health education to their

students. The main goal of this program was to help teachers feel more competent to teach health education and increase its use in the classroom.

Thirty-six participants were surveyed before the workshop with follow-ups at six months and one year. Teacher observations, oral examinations, and written examinations were used to evaluate program objectives.

The BRDHD contracted with the Department of Health and Safety at Western Kentucky University to conduct this workshop as a three hour graduate course held during its summer sessions. Stipends were awarded to workshop participants to help defray course enrollment fees.

6) Girls Club

The BRDHD developed and implemented a health education course for 10 girls aged 11-17 enrolled at the Bowling Green Girls Club.

Participants were evaluated by using a pre/post health knowledge test and health attitude/behavior survey. No control group was available for this group so that maturation effects could not be estimated.

7) Community Health Risk Factor Prevalence Survey

The BRDHD conducted a follow-up telephone survey of 250 adults in the Bowling Green area.

A computer-selected, random sample of 250 people was selected by using the telephone directory as the sampling frame. The telephone interviews were conducted by health department staff. As in the previous year's survey, a large percentage of females responded.

The small sample size of this survey limited analysis of some categories. The previous year's survey is considered to be more accurate than this smaller study.

HERR 1982-83

1) Head Start Children

The BRDHD provided the previously developed preschool health education curriculum to 162 Head Start children.

Pre/post health knowledge tests were administered to all participating students. Control groups were eliminated due to findings during the previous grant year study.

2) Day Treatment Program for Juvenile Offenders

The BRDHD implemented a 30 hour health education course to 28 juvenile offenders enrolled in the Bowling Green Day Treatment Center. Pre/post health knowledge tests and attitude/behavior questionnaires were administered to all participants.

3) Elementary School Teachers

A workshop was conducted for 25 elementary school teachers emphasizing techniques for teaching health education to their students. The main goal of this program was to help teachers feel more competent to teach health education and increase its use in the classroom.

Twenty-five participants were surveyed before the workshop with six month and one year follow-ups. Teacher observations, oral examinations, and written examinations were used to evaluate program objectives.

The BRDHD contracted with the Department of Health and Safety at Western Kentucky University to conduct this workshop as a three hour graduate course held during its summer session. Stipends were awarded to workshop participants to help defray course enrollment fees.

4) Medical Self-Care Course

The BRDHD implemented the 16 session medical self-care course to 30 community participants. Pre/post health knowledge tests and attitude/behavior questionnaires were administered. A six month telephone survey was conducted as a follow-up using a modified version of the attitude/behavior survey.

5) Elderly

The BRDHD conducted a modified medical self-care course for 27 elderly participants living at Bowling Green Towers. Pretests on health knowledge, attitude, and behavior were verbally administered by the project staff. Due to attrition, posttesting was not conducted.

HERR 1983-84

1) Head Start Children

The BRDHD provided the preschool health education curriculum to 328 Head Start children. Pre/post health knowledge tests were administered to all participating students.

2) Day Treatment Program for Juvenile Offenders

The BRDHD implemented a 30 hour health education program for 30 juvenile offenders enrolled in the Bowling Green Day Treatment Center. Pre/post health knowledge tests and attitude/behavior questionnaires were administered to all participants.

3) Elementary School Teachers

A workshop was conducted for 39 elementary school teachers emphasizing techniques for teaching health education to their students. The main goal of this program was to help teachers feel more competent to teach health education and increase its use in the classroom.

Thirty-nine participants were surveyed before the workshop with six month and one year follow-ups. Teacher observations, oral examinations, and written examinations were used to evaluate program objectives.

The BRDHD contracted with the Department of Health and Safety at Western Kentucky University to conduct this workshop as a three hour graduate course held during its summer session. Stipends were awarded to workshop participants to help defray course enrollment fees.

4) Medical Self-Care Course

The BRDHD offered the 16 session medical self-care course to 22 homemakers and hospice lay volunteers. Pre/post health knowledge tests and attitude/behavior questionnaires were administered. Controls were eliminated due to significant findings of the same course during past grant studies.

5) Health Fair

The BRDHD conducted a two-day community health fair consisting of educational materials, health screenings, and counseling.

A follow-up was conducted on all 1,000 health screening participants by mail noting the individual's area of health concern and encouraging them again to visit their physician for further evaluation.

6) Industrial Wellness

The BRDHD implemented a pilot industrial wellness program to 281 employees (58% of their workforce) of the Dollar General Corporation. The employees participated voluntarily.

Health screenings, self-reported health risks, and an attitude/behavior questionnaire provided significant information for the project staff to counsel each employee on their specific areas requiring improvement and/or physician follow-up. A summary of the participants' outcome

was presented to industry management with suggestions for improving their employees' health.

The BRDHD also conducted a nutrition/weight control class for 13 Dollar General Corporation employees. These employees voluntarily enrolled in this program. The participants were administered a pretest to determine attitude, knowledge, and skills regarding nutrition. Due to a 54% attrition, post evaluation with the small numbers remaining was not feasible.

HERR 1984-85

1) Industry Wellness

The BRDHD conducted health assessments of 160 employees of the R.R. Donnally industry. A composite of employee health risks was presented to company management with suggestions for intervention programs to enhance the health of their employees.

The BRDHD implemented a walking program for employees of the BRDHD. Fifty people signed up to participate (50% of the workforce). Participants turned in weekly mileage reports to the project staff. At the end of the eight week program, three mileage categories were developed. Participants were placed in their appropriate category and a name from each category was drawn for a prize.

2) Health Fair

The BRDHD conducted a two-day community health fair consisting of educational materials, health screenings, and counseling.

A follow-up was conducted on all 1,400 health screening participants by mail noting the individual's area of health concern and encouraging them again to visit their physician for further evaluation.

3) Mentally Handicapped Individuals

The BRDHD developed and conducted a pilot health education program to 14 mentally handicapped individuals at the Panorama Treatment Center in Bowling Green, Kentucky.

4) Smoking Cessation

The BRDHD conducted three smoking cessation programs for 46 self-selected community participations. The American Cancer Society Smoking Cessation program was utilized for these programs. The statistics from these classes were combined to achieve a larger sample size and because the treatment was essentially the same. Participant smoking behavior was recorded before and after the intervention program.

5) Elderly

The BRDHD conducted an 11 session health education program for 12 elderly individuals at the Bowling Green Towers.

A pre/post health knowledge test was verbally administered to the participants. Also, a post course behavior survey was administered to participants.

HERR 1985-86

1) Industry Wellness

The BRDHD provided health assessment and counseling to 680 employees of three area industries. Health risk factor composites were presented to management of each industry. The project staff suggested specific interventions for each individual industry to help employees achieve better health.

The BRDHD provided a stress reduction intervention for faculty and staff of Western Kentucky University. Stress was measured before and after treatment using the General Wellbeing Schedule (GWBS), a standardized instrument. A control group was identified and administered the GWBS, but analysis of the pretest scores revealed that the control group experienced substantially less stress than the experimental group. This led the evaluators to conclude that the control group was inappropriate for evaluation purposes. A one month follow-up was conducted after course completion.

Other Industry Wellness activities conducted were not evaluated. Enrollment and participation was recorded for a variety of activities including: walking program, aerobics, cholesterol programs, etc.

2) Health Fair

The BRDHD conducted a two-day community health fair consisting of educational materials, health screenings, and counseling.

A follow-up was conducted on all 1,000 health screening participants by mail noting the individual's area of health concern and encouraging them again to visit their physician for further evaluation.

3) Mentally Handicapped Individuals

The BRDHD conducted a health education course for 25 mentally handicapped individuals enrolled in three programs in Bowling Green, Kentucky.

This program was evaluated in three ways. First, because behavior problems are common in this population, the level of disruptive behavior was measured as an indicator of general interest. Second, feedback from the behavior management team at Panorama

(treatment program's name) was elicited as a means of assessing student interest and involvement. Finally, health related knowledge was measured using a questionnaire. Because the first two measures are largely subjective, only the health knowledge scores were subjected to formal statistical analysis.

4) Smoking Cessation

The BRDHD conducted five smoking cessation programs for 92 self-selected individuals. The American Cancer Society Smoking Cessation program was utilized for these programs. Participant smoking behavior was recorded before and after the intervention program.

Two of these programs were conducted in industry settings. One industry caused conflicts by shifting employees' work schedules which forced the cancellation of the scheduled program. The other industry was experiencing internal unrest which created an environment that was not conducive for behavior change. This program began with 30 participants and concluded with only two participants.

HERR 1986-87

1) Elderly

The BRDHD revised and implemented an elderly wellness program to 100 participants at three locations. Pre/post health knowledge tests were administered. Participants were allowed to take the pretest home with them due to class time limitations. This was a poor strategy. Most participants never returned them and of those tests returned, very few followed the instructions of putting their identification number on the test.

2) Smoking Cessation

The BRDHD conducted three smoking cessation programs for 27 self-selected participants.

The American Cancer Society Smoking Cessation program was utilized for these programs. Participant smoking behavior was recorded before and after the intervention. Two of these programs were conducted for industries.

3) Industry Wellness

The BRDHD conducted health assessments and counseling for a total of 669 employees at three separate industries. Group composites of employee health risks were presented to each individual industry. Specific interventions were recommended to each company to improve employee health status.

The BRDHD conducted a four session weight control program for one industry. Pre/post knowledge tests were administered to all 13

participants. In addition, body weight was measured during each session.

General one-time educational programs at industries were not statistically evaluated.

HERR 1987–88

1) Health Action – Elderly and Community Wellness

The BRDHD conducted a medical self-care curriculum for 267 individuals at eight sites. The majority of persons receiving this instruction were elderly with sensory and muscoskeletal impairments which made it impractical to collect data pertaining to knowledge gained.

2) Smoking Cessation

The BRDHD conducted four smoking cessation programs at four locations for 66 self-selected participants.

The American Cancer Society Smoking Cessation program was utilized for these programs. Participant smoking behavior was recorded before and after the intervention program.

3) Industry Wellness

The BRDHD conducted health assessments and counseling for 1,084 employees at five industries. Group composites of employee health risk factors were presented to each industry, respectively. The project staff recommended specific interventions for each industry to help their employees reduce their health risks.

The BRDHD conducted a weight control program for one industry. Pre/post data was collected from 13 participants on health knowledge, behavior, and body weight.

One-time educational programs were not evaluated in industries.

NOTES

[35]Lawrence W. Green et al., Health Education Planning, pp. 12–16.

[36]Ibid., pp. 64–65, 82–83.

[37]David A. Bedworth and Albert E. Bedworth, Health Education, A Process for Human Effectiveness, pp. 91-95.

[38]Thomas D. Cook and Laura C. Leviton, "Reviewing the Literature: A Comparison of Traditional Methods with Meta-analysis," Journal of Personality 48 (December 1980): 449.

CHAPTER III

Results

The program evaluation allowed the BRDHD to identify successful outcomes as well as less productive interventions. Some of these interventions and screenings did not provide quantitative results and due to the small number of participants some of the numbers obtained are not reported. However, subjective results which pertain to the success of these programs as well as valuable lessons learned are considered to be important results and are included in this chapter. Overall, the results indicate that the BRDHD HERR demonstration has been an efficient, innovated program and a generally successful project. A chronology of the HERR program activities was presented in Chapter II. Program evaluation results are presented in a similar chronological summary. These results reflect the programs status as of June 30 of the BRDHD's fiscal year.

HERR 1980-81

1) Minority Task Force Advisory Committee

This workshop provided for the 12 minority community leaders focused on wellness issues such as smoking, alcohol and drug use, exercise, and nutrition.

The group was not administered the health knowledge test. In addition, no control group was available and the number of participants was small. Thus, the results of this evaluation must be viewed with caution.

The health attitude and behavior survey was administered before and after the course. The survey comparisons reveal that following the

course the participants reported: 1) an increased level of exercise (daily: 16.7%, n = 2 vs 8.37%, n = 1, 3–6 days per week: 50%, n = 6 vs 41.7%, n = 5, 1–2 days per week: 16.7%, n = 2 vs 0%, n = 0); 2) a decreased level of stress (daily: 16.7%, n = 2 vs 25%, n = 3, 3–6 days per week: 0%, n = 0 vs 25%, n = 3); and 3) a decrease in the number of cigarettes smoked per day (0–10: 83.3%, n = 5 vs 60%, n = 3, 11–20: 16.7%, n = 1 vs 40%, n = 2). The small sample size and the lack of controls prohibit attributing these changes solely to the treatment effect.

2) Head Start Children

The BRDHD developed a comprehensive health education curriculum for preschool students entitled "Hale and Hardy's Helpful Health Hints." Hale and Hardy are two elfin characters created to enhance the interest and participation of the students. The curriculum was based on the Health Education Curricular Progression Chart designed by the National Center for Health Education.

The Southern Kentucky Head Start Central Office assisted the BRDHD in providing teacher training on how to use this curriculum.

The evaluation plan utilized an instrument used in the Longitudinal Study of the Primary Grades Health Curriculum Project. This picture identification instrument was administered by the Head Start teachers to their students.

3) Day Treatment for Juvenile Offenders

The evaluation of the health education course for this population indicated significant improvement in the treatment group from pretest to posttest knowledge. The control group observed scores were higher than the experimental group on the pretest ($\bar{x}$ = 14.7 vs 13.6) and lower on the posttest ($\bar{x}$ = 14.7 vs 17.4). These results suggest improvement in the experimental group; however, neither pretest nor posttest comparisons between experimental and control groups achieved significance at the .05 level (T = 1.30, DF = 34, p = 0.201). The small sample size (n = 21) probably contributed to this outcome. Overall, the analysis of the knowledge test suggests that the experimental group benefited from the class. Pretest and posttest attitude and behavior data was also collected on both the experimental and control groups. The following discussion will address those attitudes where significant changes were observed in the treatment group.

The experimental group reported measurable attitude changes in the following cigarette smoking related attitudes.

Cigarette smoking is harmful to your health. The percentage who strongly agreed increased from 63.2% (n = 12) in the pretest to 75.0% (n = 15) in the posttest. The percentage decreased in the control group from 83.3% (n = 15) to 62.5% (n = 10).

People smoke to think more clearly. The percentage who either strongly or mildly disagreed increased from 47.3% (n = 9) on the pretest

to 70.0% (n = 14) on the posttest. Among controls, the percentage who agreed increased from 27.8% (n = 5) to 56.3% (n = 9).

Teenage smokers think they are grown up. The percentage of the experimental group who strongly agreed dropped from 42.1% (n = 8) on the pretest to 33.3% (n = 6) on the posttest. The number of controls who strongly agreed stayed the same (n = 5).

Smoking gives a good feeling. The percentage of the experimental group who strongly disagreed increased from 26.3% (n = 5) in the pretest to 52.6% (n = 10) in the posttest. The number of controls who strongly disagreed decreased from 33.3% (n = 6) to 13.3% (n = 2).

The behavioral changes observed in the experimental group are given below.

When was the last time you smoked? The percentage reporting that they had smoked this week fell from 93.3% (n = 14) to 76.5% (n = 13) between pre and posttest. The percentage for the control group increased from 76.5% (n = 13) to 92.4% (n = 12).

How often do you smoke? The percentage responding that they smoked "about everyday" dropped from 93.3% (n = 14) on the pretest to 76.5% (n = 13) on the posttest. (Note: This change and the one above reflect a change of only one individual.) Among controls, the percentage increased from 76.5% (n = 13) to 92.9% (n = 13).

How many cigarettes do you smoke per day? The percentage reporting that they smoked less than one cigarette per day increased from 6.7% (n = 1) to 18.8% (n = 3) in the experimental group. The control group percentage decreased from 23.5% (n = 4) to 0%.

A six-month follow-up was conducted for both the experimental and control groups to evaluate their attitudes and behaviors. Many of the members of each group had left the Day Treatment program during this time which made it difficult for the BRDHD to contact these participants by mail. The interpretation of this follow-up data was complicated by the small number of respondents. Differences in attitudes and behaviors were observed; however, none were statistically significant.

4) Elementary Teachers

Thirty-three teachers completed this workshop. Each participant was successful in completing the requirements of the workshop and received graduate course credits.

The objective to implement a successful workshop was met. Evaluations were very positive and each participant was involved in several hands-on activities and observed many more. Workshop participants reported increasing classroom time spent on health education by 82% at the six month follow-up and by 189% at the one year follow-up. Follow-up data also demonstrated utilization of a wide variety of risk reduction activities taught in the workshop. The vast majority of the teachers

reported these activities to be successful learning experiences for their students.

5) Community Health Risk Factor Prevalence Survey

A random sample of 500 adult residents of the city of Bowling Green was surveyed by telephone to assess health related attitudes and behaviors. Responses were coded, keypunched, and subjected to statistical analysis. The following is a summary of the findings.

Characteristics of the Sample:

Age: Approximately 34% (n = 170) of the sample were between 18 and 29 years of age, 30% (n = 150) were 30–44 years, 23% (n = 115) were between 45 and 64, and 13% (n = 65) were age 65 or older.

Sex: One hundred forty individuals or 28% of the sample were male and 360 or 72% were female.

Race: Approximately 89% (n = 445) of the sample were white, 10% (n = 50) were black, and less than 2% (n = 10) were of other racial groups.

Education: Approximately 11% (n = 55) of the sample had an 8th grade education or less, 42% (n = 210) had between 9 and 12 years of education, and 46% (n = 230) had 13 or more years of education.

Employment: Approximately 19% (n = 95) of those sampled reported their occupation as being either professional or managerial; 17% (n = 85) reported their occupation as clerical or skilled; 20% (n = 100) reported farming, semi-skilled, or service related employment; and 43% (n = 215) reported no employment. The latter category included both unemployed persons and housewives.

Income: Approximately 26% (n = 130) of those sampled reported a combined family income of less than $10,000/year, 27% (n = 135) reported an income of between $10,000 and $19,000 per year, 26% (n = 130) reported income between $20,000 and $29,000, and 10% (n = 50) of $30,000 a year or more.

Marital Status: Three hundred sixteen persons reported being married (63%), 10 reported being separated (2%), 42 reported being widowed (8.4%), 35 reported being divorced (7%), and 94 reported never having been married (18.8%).

Tobacco Use: Several questions dealt with the use of cigarettes and attitudes toward smoking.

Growing Tobacco: Seventy-four persons or approximately 15% of those sampled reported that their families were involved in the production of tobacco.

Smoked 100 Cigarettes: Two hundred two persons (40.4%) reported that they, in their lifetime, had each smoked at least 100 cigarettes.

Age When Started Smoking: Most smokers and ex-smokers started smoking between the ages of 11 and 20 (152 persons).

Current Smokers: One hundred thirty-two persons or 26% of those sampled reported that they currently smoke.

Inhale: The majority of smokers reported that they inhale either moderately or deeply (94 persons).

Ex-smokers: Sixty-six persons reported that they had stopped smoking. More than half (36) of these persons had stopped for at least five years.

Alcohol Use: Two hundred fifty-nine persons (51.8%) reported that they had consumed alcohol during the past year. Two hundred thirty-nine (47.8%) reported that they had not.

Days of Alcohol Use: Among persons who drink, the majority (208 persons) reported using alcohol 10 days or less during the past month. Only 24 persons reported using alcohol more than 15 days during the preceding month.

Consumption Per Day: Among persons who drink, most reported consuming no more than two drinks on days that they consumed alcohol (205 persons). Forty-three persons reported consuming 3–5 drinks/day and only 6 persons reported consuming more than 5 drinks per day.

Other Health Related Information:

Pregnancy: Thirteen women reported being pregnant at the time of the survey.

Use of Birth Control Pill: Fifty-five women reported using birth control pills, while 304 said they did not use the pill.

Blood Pressure Check: The vast majority (487 or about 97% of the sample) reported having had their blood pressure checked at some time. Three hundred ninety persons (78%) of those sampled had had their blood pressure checked during the past 12 months.

High Blood Pressure: One hundred five persons (21%) reported that they had been told that they have high blood pressure. Seventy-two of those individuals reported being treated for high blood pressure.

Exercise: Only 12% (n = 60) of the sample reported experiencing vigorous physical exertion during the work day. Approximately 48% (n = 240) reported that they exercise at least three times per week (30% said they exercised daily). Most who exercised regularly reported that their exercise sessions last 30 minutes or less and only 20% (n = 100) reported that they exercised enough to sweat at least 3 times per week.

Diet: One hundred forty-one persons (28%) reported that they regularly salt their food before tasting it. Three hundred thirty-five

(67%) reported eating meat daily and 266 (53%) reported eating sweets at least three times per week.

Stress: One hundred twelve persons (22%) reported feeling stress daily and another 91 persons (18%) reported experiencing stress between 3 and 6 times per week. One hundred thirty-six persons (27%) reported that they seldom experienced stress. One hundred forty-four persons (29%) reported doing something to relieve stress daily and another 164 persons (33%) reported trying to relieve stress at least once per week. One hundred fifty-five persons (31%) reported that they seldom tried to relieve stress.

Obesity:

The algorithm recommended by the American Dietetic Association to calculate ideal weight by height and sex was applied to the telephone survey sample (N = 500). Persons whose weight was less than 20% over the calculated ideal weight were classified as being of normal weight. Persons whose weight exceeded 20% of the ideal level were classified as being obese.

Obesity by Sex: 10.1% of the males (n = 14) and 32.7% of the females (n = 118) surveyed were classified as being obese.

Obesity by Race: 26.1% of the whites (n = 116) and 31.4% of the blacks (n = 16) surveyed were classified as being obese.

Obesity by Age: As the following table reveals, a larger percentage of older persons were classified as being obese.

Age	18–29	30–44	45–64	65 +
# obese	31	33	43	25
% obese	18.5	21.7	37.7	39.1

Obesity by Education Level: As revealed in the following table, persons with higher levels of education were less likely to be classified as being obese.

Yrs. of Ed.	0–8	9–12	13 +
# obese	25	71	34
% obese	44.6	33.8	14.9

Obesity by Exercise Level: As the table below illustrates, persons who exercise regularly are less likely to be classified as being obese.

Frequency of Exercise	Daily	3–6/wk	1–2/wk	Less Than Weekly	Seldom
# obese	31	24	17	6	54
% obese	20.4	27.9	20.7	30.6	34.0

Differences Among Sexes:

Smoking: A larger percentage of men reported having smoked at least five packs of cigarettes (56% vs 35%). Men also reported beginning to smoke at a younger age. Only 11% of women smokers reported smoking 31 or more cigarettes/day while 21% of the men reported this level of consumption. A larger percentage of male smokers reported inhaling deeply (27% vs 11%).

Alcohol: A larger percentage of males reported drinking alcohol during the previous year (73% vs 44%). Sixty percent of male drinkers reported drinking on at least six days during the previous month while only 20% of the women reported this level of consumption. Thirty-two percent of the male drinkers reported consuming three or more drinks on the days they drank compared with 11% of female drinkers.

Blood Pressure: A larger percentage of women reported having been told they have high blood pressure (24%, n = 86 vs 14%, n = 19.6).

Exercise: As expected, a larger percentage of men reported vigorous exercise related to their occupation (22%, n = 31 vs 9%, n = 32). A larger percentage of males reported exercising daily (44%, n = 62 vs 26%, n = 94) and a larger percentage of women reported that they seldom exercise (37%, n = 133 vs 19%, n = 27). Males who exercise also reported exercising longer and more vigorously.

Diet: More women reported salting food before tasting (31%, n = 112 vs 22%, n = 31). A larger percentage of men reported eating meat daily (74%, n = 104 vs 65%, n = 234).

Stress: A larger percentage of women reported experiencing stress daily (25%, n = 90 vs 18%, n = 25) and women were slightly more inclined to take action to relieve stress.

Differences Among Races:

Income: A larger percentage of blacks reported having a family income of less than $10,000/year (47%, n = 24 vs 27%, n = 120).

Pregnancy: A larger percentage of blacks reported being pregnant. (Although blacks accounted for only 10% of the sample and 11% of the females, they accounted for approximately 38% (n = 5) of the reported pregnancies.)

Smoking: Blacks smoked at approximately the same levels as whites. Blacks tended to report starting to smoke at an earlier age, but fewer blacks reported smoking one and one-half packs or more per day.

Alcohol Use: A larger percentage of blacks reported drinking in the past year (61%, n = 31 vs 51%, n = 227). Blacks also reported somewhat more frequent alcohol use but the differences were not large.

Blood Pressure: A similar percentage of blacks and whites reported having been told they have high blood pressure.

Exercise: Exercise habits were similar for both races.

Diet: Blacks were somewhat more likely to report salting food before tasting it. They ate meat slightly less often than whites and consumed sweets with a similar frequency as reported by whites.

Stress: Blacks were less likely to experience stress daily (16%, n = 8 vs 23%, n = 102) and more likely to report that they seldom experienced stress (41%, n = 21 vs 26%, n = 116). Blacks were also less likely to take action to relieve stress.

Income and Education Effects:

Persons with higher incomes and higher levels of education were less likely to be current smokers. Alcohol consumption was roughly comparable across income groups, but persons with 13 or more years of education reported more frequent alcohol use than less educated persons.

Persons reporting higher family incomes and higher education levels were less likely to report having high blood pressure.

Work related exercise was similar across education and income levels, but higher levels of income and education were related to an increased tendency to do voluntary exercise.

Better educated persons were less likely to report salting their food before tasting. Other dietary measures were roughly similar across income and education classifications.

Persons with family incomes of $30,000/year or more were more likely to report experiencing stress daily but no more likely to report taking action to relieve stress.

Limitations of the Study:

The sample was not representative with regard to sex and probably was not representative with regard to income. The fact that many of the calls were made at hours when women were more likely to be at home and the tendency for women to more likely cooperate may explain this. It is also noted that using the telephone directory as a sampling frame excludes individuals without telephones and those with unlisted numbers.

6) Medical Self-Care Course

The Medical Self-Care Course was provided for 21 community participants. Forty self-selected individuals served as the control group. The comparisons of pre and post experimental and control group data revealed statistically significant differences on the health knowledge mean scores. The experimental group scored higher on the posttest than they did on the pretest (Pre $\bar{x} = 22.0$, Post $\bar{x} = 24.83$, DF = 37, $p = 0.045$) and the posttest experimental scores were higher than the posttest control scores (Exp $\bar{x} = 24.8$, control $\bar{x} = 20.5$, DF = 47, $p = 0.001$).

These results support the conclusion that the treatment resulted in significant gains in health knowledge.

Health attitude and behavior changes were more difficult to interpret due to the small experimental group size. However, the following program participant changes were observed on the posttest: 1) three individuals reported reducing their cigarette smoking from up to one pack per day to half a pack per day or less, 2) a larger percentage of participants reported participating in exercise at least once per week (52.4%, n = 11 vs 80.1%, n = 12).

HERR 1981–82

1) Minority Task Force Advisory Committee

Due to the small numbers of participants as well as lack of cooperation, an evaluation of this workshop was not conducted. After two years of trying to work with this advisory committee, the BRDHD decided to eliminate this group from future demonstration projects due to their lack of support.

2) Head Start Children

The BRDHD first conducted a pilot study on 40 four- and five- year old children attending a local day care program to test the health education curriculum and the evaluation instrument previously developed. After the pilot study, revisions were made to prepare for curriculum implementation in the Southern Kentucky Head Start program.

The curriculum was provided for 73 experimental students in a local Head Start program. Thirty-five students attending Head Start in a neighboring community were chosen as the control group. Overall, program results indicated a significant difference was found between the experimental and control groups regarding health knowledge after completion of the curriculum, but due to the fact that the data set was missing from these records, the statistics are not reported. Based upon the evaluation, program staff concluded: 1) the instrument utilized in this study is reliable for the Head Start population, and 2) the health education curriculum had a positive effect upon the health knowledge of the Head Start children.

3) Medical Self-Care Course

Two Medical Self-Care Courses were provided for: 1) seven Head Start mothers and 2) 15 community participants. The comparisons of pretest and posttest experimental and control group data revealed statistically significant differences, for both Medical Self-Care Courses, on the health knowledge mean scores. The experimental groups scored higher on the posttest than they did on the pretest (Mothers Pre $\bar{x} = 19.43$ vs Post $\bar{x} = 25.00$, DF = 12, $p = 0.001$, and Community Pre $\bar{x} = 19.73$ vs Post $\bar{x} = 24.60$, DF = 28, $p = 0.000$). The posttest experimental scores were also higher than the posttest control scores (Mothers Exp $\bar{x} = 25$, control

$\bar{x}$ = 14.71, DF = 12, p = 0.000, and Community Exp $\bar{x}$ = 24.6, control $\bar{x}$ = 19.69, DF = 29, p = 0.000). These results support the conclusion that the treatment resulted in significant gains in health knowledge.

The following attitude and behavior changes were observed in the experimental groups. In the community class, fewer participants reported that they seldom exercised in the posttest survey (7.1%, n = 1 vs 38.5%, n = 5). Also, more people reported that they ate sweets less than weekly (35.7%, n = 15 vs 7.1%, n = 1). The Head Start mothers' class had an extremely small class size which made any interpretation of this data speculative. There was some indication that the course may have influenced participants to practice stress reduction more frequently (71.4%, n = 5 vs 14.3%, n = 1).

4) Day Treatment for Juvenile Offenders

This class received the same evaluation as the 1980–81 Day Treatment class. The experimental group scored significantly higher on the posttest. The pretest differences between the experimental (n = 14) and control (n = 16) groups approached significance at the .05 level (experimental group $\bar{x}$ = 25.7 vs control group $\bar{x}$ = 29.1, DF = 28, p = 0.083). The posttest mean scores for the experimental and control groups were not significantly different. The experimental group, however, scored higher on the posttest ($\bar{x}$ = 34.7 vs $\bar{x}$ = 31.3, DF = 28, p = 0.152). This data appears to suggest first, that the treatment resulted in an increase in the health knowledge of the experimental group, and that the control group had more health knowledge originally.

Significant changes in reported attitude and behaviors were not observed on this data. The relatively small sample size probably accounts, in part, for the lack of unambiguous findings.

5) Elementary School Teachers

The objective to implement a successful workshop was met. Evaluations were very positive and each participant was involved in several hands-on activities and observed many more. A follow-up study found that workshop participants increased classroom time devoted to health education by 120% at the six month follow-up and by 136% at the one year follow-up. Follow-up data also demonstrated utilization of a wide variety of risk reduction activities. The teachers reported these activities to be successful learning experiences for their students.

6) Girls Club

Health education course participants from the girls club were evaluated using a health knowledge test and the health attitude/ behavior survey. Despite the small number of participants (n = 10), the mean difference in pretest and posttest was statistically significant ($\bar{x}$ = 20.6 vs $\bar{x}$ = 26.3, DF = 8, p = 0.002), suggesting that the group gained in health related knowledge during the class. No control group was available for this group so that maturation effects cannot be estimated.

Results of the pre/post health attitude and behavior survey suggest that some changes in attitudes and behaviors may have occurred during the course of the class. It appears that one or more persons may have reduced their smoking behavior; however, the small sample size does not warrant conclusions on the basis of this data.

7) Community Health Risk Factor Prevalence Survey

A second health related telephone survey of the residents of Bowling Green and Warren County was conducted by health educators employed by the Barren River District Health Department. A random sample of 250 persons was selected, using the telephone directory as the sampling frame. The small sample size of this survey was a serious limitation, however, and many categories of analysis contain very small numbers of respondents. The findings were generally consistent with the larger (n = 500) survey conducted the previous year, therefore the BRDHD utilized the statistics from the first survey and the second data set is not reported in this study.

HERR 1982-83

1) Head Start Children

The preschool health education curriculum for Head Start students was evaluated by pre and post administration of the previously developed health knowledge test. All 162 students receiving the curriculum were tested. The average number of correct responses differed significantly between the pretest and posttest (pre $\bar{x} = 20.86$, post $\bar{x} = 24.40$, DF = 160, $T = -9.06$, $p = .0001$). These findings suggest that Head Start children substantially increased their health related knowledge during the course of the health education intervention.

2) Day Treatment for Juvenile Offenders

Day Treatment students (n = 24) were administered a health knowledge test before and immediately following their health education experience. The magnitude of differences was revealed in the pretest and posttest mean scores. The average number of correct responses for the pretest was 25.8. This increased to 34.2 on the posttest. This difference was highly significant ($T = -8.92$, DF = 27, $p = 0.000$).

Day Treatment students were also administered a survey which collected general demographic data and asked questions pertaining to health attitudes and behaviors. Students in this course ranged from 13 to 17 years of age. Of the 28 students who completed the questionnaire, 27 were male and only one was non-white. The survey results suggest that little change occurred in the use of cigarettes and alcohol during the time interval of the intervention. Likewise, little attitude change was evident. It does appear, however, that fewer students agreed that it was all right to experiment with cigarettes at the end of the course (8%, n = 2 vs 28%, n = 7).

3) Elementary School Teachers

Twenty-five teachers completed this workshop. Each participant was successful in completing the requirements of the workshop and received graduate course credits.

Six month follow-up data revealed that workshop participants increased classroom time devoted to health education by 127%. Follow-up data also revealed utilization of a wide variety of risk reduction activities. The teachers reported these activities to be successful learning experiences for their students.

4) Medical Self-Care Course

The Medical Self-Care Course was evaluated using pre/post administration of a health knowledge test and pre/post administration of a health attitude and behavior inventory. A six month follow-up survey was conducted by telephone interview using a modified version of the attitude and behavior instrument (the version was abbreviated by omitting many of the attitude questions).

Comparisons of pretest and posttest health knowledge scores suggest that participants improved their health knowledge during the course. The average pretest score was 21.53. This increased to 24.76 on the posttest. The difference between pretest and posttest means was significant ($T = -4.70$, $DF = 16$, p 0.000). The small numbers involved ($n = 17$) limit the generalizability in this evaluation. While some changes were observed in health attitudes and risk-related behaviors, these changes were difficult to interpret in light of the small sample size.

In summary, participants in the medical self-care course significantly increased their health knowledge, but health attitude and behavior changes were less pronounced. It should be emphasized that the small sample size creates a situation in which only large changes in knowledge, attitudes, and behaviors will yield statistically significant results.

5) Elderly

Due to lack of interest of the elderly participants, this course was canceled and posttesting was not conducted. Participants did not remember class scheduled days and times. In addition, other social activities took priority over the health education course.

HERR 1983–84

1) Head Start Children

The health education curriculum for Head Start students was evaluated by pre- and post-administration of a health knowledge test. Three hundred twenty-eight students were evaluated. The average number of correct responses differed significantly between the pretest and

posttest (pre $\bar{x} = 20.5$, post $\bar{x} = 23.3$, $T = -10.03$, $DF = 327$, $p = 0.000$). These findings suggest that Head Start children increased health related knowledge during the health education intervention.

2) Day Treatment for Juvenile Offenders

Day Treatment students were administered a health knowledge test before and immediately following their health education experience. The average number of correct responses for the pretest was 25.8. This increased to 28.7 on the posttest. This difference was statistically significant at an alpha level of .05 ($T = -2.70$, $DF = 15$, $p = 0.017$).

Day Treatment students were also administered a survey which collected general demographic data and asked questions pertaining to health attitudes and behaviors. Students in this course ranged in age from 13 to 17 years. Of the 29 students who completed the questionnaire, 28 were male and one was female. Twenty students were white and nine were black.

The survey results were somewhat difficult to interpret because fewer students completed the posttest. In general, little attitude and behavior change was indicated, although some decrease in smoking behavior was observed (75%, $n = 18$ vs 82.8%, $n = 24$).

3) Elementary School Teachers

Thirty-nine teachers from Southcentral Kentucky completed the Risk Reduction workshop. Each participant was successful in completing the requirements of the workshop and received graduate course credit.

Though program records indicate this workshop was successful, the data set was missing; therefore no statistics were available for this study.

4) Medical Self-Care Course

The Medical Self-Care Course was evaluated using pre/post administration of a health knowledge test and pre/post administration of a health attitude and behavior inventory.

The average number of correct responses on the pretest was 20.9. This increased to 24.5 on the posttest. This difference was statistically significant at an alpha level of 0.05 ($T = -3.04$, $DF = 9$, $p = 0.014$). These findings suggest that participants increased their health knowledge during the course. The small sample size ($n = 22$) and the dearth of risk-related behaviors reported by the sample (for example, all participants reported being non-smokers and having had their blood pressure checked in the last six months) resulted in no measurable attitude or behavior changes being recorded.

5) Health Fair

A health fair is a health promotion event which offers a combination of screening services, referral for suspected abnormalities, individual

lifestyle counseling, information regarding community resources, and individual health education on a variety of topics. One thousand people participated in this year's health screening and counseling activities. In addition, the shopping mall where this event was held estimated that 80,000 people were exposed to health education materials, health promotion activities, and community health resource information from 50 health exhibits.

6) Industrial Wellness

The BRDHD implemented a pilot industrial wellness program in a local industry (Dollar General Corporation). Two hundred eighty-one employees were screened using the health-risk appraisal and the adult health attitude and behavior survey. In addition, physiological screenings which included hypertension screenings and blood chemistry analysis were offered. The information obtained in this screening was shared with individual employees and a summary report was provided for the corporate management with suggestions for helping employees improve their health.

In addition, a nutrition/weight control class was provided for 13 self-selected employees. The participants were administered a pretest to determine attitude, knowledge, and skills regarding nutrition. Due to a 54% attrition, post evaluation with the small numbers remaining was not feasible and a program evaluation was not conducted.

HERR 1984–85

1) Industrial Wellness

The industrial wellness component developed rapidly within the constraints of available resources. However, because the program was new, it had not generated the kind of specific data produced by the other interventions. The best measures of program success for developing programs are the degree of acceptance and the number of persons served/screened. Utilizing these measures, the industrial wellness component of the HERR program was clearly successful. The following narrative provides a brief overview of the industrial wellness activities.

Dollar General Corporation: The DGC continued with activities (screening, consultation) begun during the previous Fiscal Year. Approximately 265 employees have been screened. Specific interventions in the areas of smoking cessation, physical fitness, stress management, etc., were scheduled to begin no later than August 1985.

R.R. Donnelley Corporation: During FY 1984–85, approximately 160 employees were given the standard screening. On the basis of this data, the program staff will consult with R.R. Donnaly management to design a wellness program consistent with employee needs.

Barren River District Health Department: The BRDHD implemented a walking exercise ("You've Got A Right To Wellness") program. To date, approximately half of the work force (n = 50) chose to participate.

Royal Crown Bottling Company: The BRDHD negotiated an agreement with R.C. Corporation to provide screenings and wellness interventions for the company's work force of approximately 100 employees.

Western Kentucky University: The BRDHD health educators consulted with University officials to help plan and implement a wellness program for more than 1,000 employees. Several meetings were held and health department staff submitted a formal proposal to the University.

2) Health Fair

Fourteen hundred people participated in this year's health screening and counseling activities. In addition, the shopping mall where this event was held estimated that 80,000 people were exposed to health education materials, health promotion activities, and community health resource information from 50 health exhibits.

3) Mentally Handicapped Individuals

This intervention was a pilot effort to test the feasibility of providing health education for a mentally retarded population. The small sample size (n = 14) and high attrition rate precluded formal statistical comparisons. However, observations by BRDHD staff suggested that change occurred in several patients and the program was considered successful.

4) Smoking Cessation

Three smoking cessation programs were conducted for self-selected community participants. The results of these evaluations were combined to achieve a larger sample size and because the groups received essentially identical treatments. The combined groups had 46 participants. Fifteen participants reported that they had stopped smoking at the end of the last session for a success rate of 32.6 percent. In most smoking cessation programs, some individuals will attend only some of the sessions. These people are not exposed to the full treatment and may lack adequate motivation for behavior change. Among the three groups analyzed here, only 21 persons attended all four sessions. Of these, 14 stopped smoking for a success rate of 66.7 percent.

5) Elderly

This intervention provided a general health education curriculum tailored to the health needs of the elderly. A pre- and post-health knowledge test was administered to 12 program participants. Those surveyed gave more correct responses on the posttest for seven of the test questions, fewer correct responses on three questions, and the same number of correct responses on two questions. This suggests that some learning did occur during the intervention.

Participants were also surveyed on their lifestyle habits. These results suggest that some participants made changes in health-related behaviors following exposure to the health education curriculum.

HERR 1985–86

1) Industry Wellness

The industrial wellness component of the HERR program developed rapidly and enjoyed considerable success during FY 1985–86. During that time period, the BRDHD provided wellness programs to three employers with a combined work force of more than 3,300 persons. More than 800 health assessments were performed at these work sites. Each assessment consisted of: 1) CDC Health Risk Appraisal, 2) Height and Weight Measurement, 3) Blood Pressure, 4)Blood Chemistry (SMA 24 with coronary risk profile), and 5) Individual Counseling based on results. In addition, the BRDHD health education staff provided consultation services, planning assistance, and information to seven additional employees. Several of these employers later planned or implemented wellness programs.

The following is a brief employer specific overview of the industrial wellness activities. Because screening and assessment precedes intervention programs, utilization rates continue to provide the best numerical indicators of program success.

Barren River District Health Department: Approximately 65 agency employees have participated in one or more wellness activities. The BRDHD completed a walking program and also implemented a "Deskercise" exercise program. A monthly wellness newsletter was also created for agency staff.

Western Kentucky University: Forty percent of the full-time faculty and staff (600 employees) participated in phase I (screening/assessment) of the WKU wellness program. Phase II, which offered a variety of wellness/fitness activities and services such as walking, aerobics, and health information courses, also experienced good participation rates. One intervention, a stress reduction course, was evaluated. A stress reduction intervention was conducted for faculty and staff of Western Kentucky University. Stress was measured before and after treatment using the General Wellbeing Schedule (GWBS), a standardized instrument. A control group was identified and administered the GWBS, but analysis of the pretest scores revealed that the control group experienced substantially less stress than the experimental group. This led the evaluators to conclude that the control group was inappropriate for evaluation purposes.

Mean GWBS scores for the treatment group were 62.9 on the pretest, 71.4 on the posttest, and 79.1 on the follow-up conducted one month after completion of the intervention. A repeated measures analysis of variance revealed these differences to be statistically significant at the 0.05 level ($p = 0.034$). The total score on the GWBS is interpreted as

follows: 1) 60 and below–Severe Distress, 2) 61–72–Moderate Stress, and 3) 73–110–Positive Well-Being. Subjects improved from borderline severe/moderate stress to positive well-being from the pretest to the follow-up. It is also noteworthy that only seven persons completed all three tests. To obtain statistically significant results with such small numbers requires substantial treatment effects.

Eaton Corporation: This company screened 50 employees in a pilot program and is considering screening 50 more, pending evaluation of the first group. The company also implemented plant-wide smoking discouragement and seat belt programs.

Holley-Carburetor Corporation: Implemented a walking program and planned a general health screening, a nutrition program, smoking cessation, and stress management.

Lenk Corporation: This employer subsidized the cost of employee enrollment in a local fitness center. They contacted BRDHD for a screening/assessment to be conducted during the summer of 1986. The management reviewed a proposal submitted by BRDHD and expressed interest in offering several interventions to the company's 200 employees.

Logan Aluminum: BRDHD staff planned a screening/ assessment for this company's 600 employees. The corporate nurse performed the blood work and administered the health risk appraisal as part of a required, annual physical performed by the corporate physician. This industry expressed strong managerial support for industrial wellness.

R.R. Donnelley & Sons: BRDHD staff completed a cancer education program conducted during the lunch period at the work site. Participation was less than expected because employees resented the intrusion during their lunch hour. In addition, project staff judged management support to be inadequate. After discussing these difficulties with company management, steps were taken to improve the working relationship.

South Central Rural Telephone: This company requested BRDHD assistance in developing a work site wellness program. After discussions with management, project staff submitted a proposal for review. During the next fiscal year, a screening/assessment and interventions were conducted at this work site.

Kentucky Department of Transportation: The Bowling Green Branch of DOT requested assistance in establishing a work site wellness program. Project staff submitted a proposal to management for review. However, management decided to postpone plans for a wellness program.

Royal Crown Bottling Company: BRDHD staff conducted a screening/ assessment and individual counseling for this company during FY 1985–86. A number of health risks were identified in this work force and these results were reported to the management along with recommendations for specific interventions. Unfortunately, the

management failed to follow through with the program and after several unsuccessful attempts of follow-up, the BRDHD terminated its efforts to work with this company.

During the course of FY 1985–86, BRDHD staff gained valuable experience and expertise in promoting and implementing industrial wellness programs. In addition, project staff attempted to establish guidelines for future efforts to help maximize the return on the agency's limited resources. Three general principles were adopted for future BRDHD efforts in industrial wellness:

First, the support of top management is essential to program success. Project staff will attempt to determine the level of support before investing large amounts of time and resources.

Second, the return on BRDHD resources will be maximized when they help establish an ongoing program which the company is committed to sustain. Accordingly, project staff will attempt to educate management and the work force regarding the benefits of ongoing health promotion efforts and help companies develop the expertise to sustain wellness programs.

Third, the BRDHD can serve as a consultant and information source as well as provide specialized services to established programs with minimal commitment of staff resources. The focus should be to add those components which employers cannot generate in-house while enhancing in-house capabilities.

2) Health Fair

One thousand people participated in this year's health screening and counseling activities. In addition, the shopping mall where this event was held estimated that 80,000 people were exposed to health education materials, health promotion activities, and community health resource information from 50 health exhibits.

3) Mentally Handicapped Individuals

The BRDHD conducted health education interventions for four groups of mentally handicapped individuals at three locations. These interventions were largely experimental and were intended to determine the feasibility of providing health education services for this population.

The program was evaluated in three ways. First, because behavior problems are common in this population, the level of disruptive behavior was measured as an indicator of general interest. Second, feedback from the behavior management team at one location was elicited as a means of assessing student interest and involvement. Finally, health related knowledge was measured using a questionnaire. Because the first two measures are largely subjective, only the health knowledge scores were subjected to formal statistical analysis.

Student behavior was not a problem during the sessions, indicating that interest was maintained. Feedback from program staff was very positive. They informed BRDHD staff that the health class was one of a very few instructional programs to experience so few behavioral problems.

Statistical analysis of the four groups revealed a significant increase in one group (pretest $\bar{x} = 72.7$, posttest $\bar{x} = 83.3$, $n = 8$, $F = 8.34$, $p = 0.02$) and no significant differences in the other three. It is noted that the sample size was small in all groups (two groups of 8, one of 4, one of 5).

Overall, the results suggest that health education can be successfully presented to the mentally handicapped and that measurable knowledge gains can occur.

4) Smoking Cessation

Five smoking cessation programs were conducted for 92 self-selected participants. Due to conflicts in the two industry setting programs discussed in Chapter II, success rates are calculated using only the completed program data. Completed programs consisted of 51 participants with 21 (41%) of these reporting they had stopped smoking by the end of the program.

HERR 1986–87

1) Elderly

Program staff developed and implemented a new elderly wellness program during FY 1986–87. The program was based on a curriculum covering nutrition, exercise, and medical consumerism. The program was offered to four groups of senior citizens at three sites. Attendance remained good throughout the sessions and the health educators reported high levels of interest on the part of participants.

Although more than 100 participants were served by this program, serious problems arose in the data collection procedures for all groups. Only 31 participants completed the pretest and 54 completed the posttest. The number of completed pretests per group ranged from 4 to 10 and the number of completed posttests per group ranged from 4 to 34.

Participants were evaluated with respect to knowledge gained. The preferred method for analyzing these data is the repeated measures analysis of variance. However, this statistical procedure requires that pretests and posttests be matched for each participant. Unfortunately, most respondents failed to follow instructions to write an identification number on their pretests and posttests. Only six pretests and posttests could be matched for analysis purposes and no significant differences were observed (or expected given the limited sample size). Comparisons of mean scores for each group individually and for all groups combined failed to reveal statistically significant changes.

2) Smoking Cessation

A smoking cessation program was conducted at the BRDHD central facility in November 1986. The program was open to the general public and was based on the American Cancer Society Fresh Start Program. The program attracted 13 participants and two (18%) had stopped smoking by the end of the program.

In addition, two smoking cessation programs were conducted at Lenk Corporation as part of the Industry Wellness component. Eleven of the 14 total participants (79%) had stopped smoking by the end of the intervention.

3) Industry Wellness

The following narrative describes the activities for each employer group served.

Barren River District Health Department: A monthly newsletter called "Wellness News" was added to the ongoing wellness program. Through this newsletter, approximately 200 employees received information on the following topics:

July 1986 – Sun damage to the skin, skin cancer, choosing sunglasses, safe picnics, motion sickness, cool drink recipes.

August 1986 – Water safety, drowning, boating safety, camping safety, hiking safety.

September 1986 – Eye safety, protection and prevention, eye emergencies, David Brenner's Fitness through Fun Plan.

October 1986 – Family sex education, parent–teen communication, anatomy, positive thoughts for today.

November 1986 – Diabetes, what is it, warning signs, treatment, Diabetic recipes, toy safety, age appropriateness.

December 1986 – Alcohol Awareness, drinking and driving, non-alcoholic drinks.

January 1987 – Pap Smears, amniocentesis risks, fireplace air pollution in the home, health foods, stress and coping, nutrasweet, cold weather dangers.

February 1987 – Dental Health Month–dental health fair, dental programs of the health department, preventing heart attacks, passive smoke, taking your own blood pressure, walking.

March 1987 – National Nutrition Month, sugar, low fat foods, food additives, hugging.

April 1987 – Warning signs of cancer, medic alert bracelets, drowning–water rescue, fruit-puzzle.

May 1987 – Biking, insect bites, marine life bites and stings.

June 1987 – Dairy Month, high calcium recipes, heat stroke, exhaustion.

R. R. Donnelley & Sons: This industry has an established wellness program which was initiated with the assistance of the health department two years before. The health department continued to provide consultation, technical assistance, and educational materials. The company disseminates this information to employees through a newsletter and brochures.

Eaton Corporation: Two years before, the health department provided a pilot wellness program for 50 of this company's employees. The pilot program was considered a success and the company expressed interest in an expanded program. However, managerial indecision and labor problems (including strikes) delayed action for more than a year. However, during 1987–88 the corporation requested assistance in implementing a wellness program. Initially, 150 of the company's employees were served by this program which was, in effect, an expanded pilot program. The corporation plans to ultimately provide wellness services to all 1,500 employees and to provide such interventions as are indicated by screening results.

Lenk Corporation: Health screening and counseling were provided to all 225 employees of this company. After reviewing the screening results, project staff recommended educational/intervention programs in the following areas: smoking cessation, weight control, and seat belt use during FY 1986–87. Two smoking cessation programs were completed at this work site with remarkably successful results. Eleven of the 14 participants (79%) had stopped smoking by the end of the interventions.

Logan Aluminum Corporation: Project staff have provided health screening and follow-up counseling to more than 400 of the company's 650 employees. The slow pace of the screening results from management's desire to combine screening and counseling with the annual physicals provided on site by the corporate medical department. Although initially concerned that this procedure would delay implementation of the wellness program, project staff have found certain advantages in this phased implementation. Project staff screen and counsel, on average, about 12 employees each week. Because of the small numbers, they are able to spend more time counseling each employee. In addition, because project staff are on site each week, employees can come back to ask questions or obtain additional information and support for the lifestyle changes they are trying to accomplish. The phased implementation has also given project staff more time in contact with the corporate medical department and with

management. As a result, excellent working relationships have developed.

In addition to the screening/counseling, project staff have helped the corporate medical department establish an ongoing weight reduction program and have worked with the medical department to provide a program on Acquired Immune Deficiency Syndrome (AIDS) for plant employees.

South Central Rural Telephone: Project staff conducted health screening and follow-up counseling for 44 of this company's 83 employees. All participants were volunteers and the high level of participation (53%) reveals considerable interest in wellness among these employees. After reviewing composite screening data, project staff recommended the following intervention programs: hypertension control, smoking cessation, nutrition education, weight control, and seat belt usage. To date, project staff have provided: a first aid course for company linemen, an hour-long educational program on hypertension and cholesterol control for 25 employees, and a four-session weight control program for 13 employees. Statistical analysis of data generated by the weight control program revealed significant (at the 0.05 level) increases in knowledge related to nutrition and weight control among participants. Measured weight change from session one to session four did not reveal a significant reduction in body weight. Currently, project staff are helping this employer provide a cardio-pulmonary resuscitation (CPR) class for its employees.

Western Kentucky University: This large employer has an established wellness program which was developed two years ago with the assistance of project staff. The University continues to provide wellness services for its 1,500 employees including: aerobics classes, swimming, health walking, weight training, jogging, smoking cessation, and health information through the employee newsletter. Project staff continue to provide technical assistance and health education services for this employer. In addition, project staff served on the University wellness committee.

HERR 1987–88

1) Health Action–Elderly and Community Wellness

The Health Action medical self-care course curriculum was presented to 267 individuals at eight sites. The majority of persons receiving this instruction were elderly with sensory and other muscoskeletal impairments which made it impractical to collect data pertaining to knowledge gained. The classes were well received, however, as evidenced by the number of participants in the following:

First Baptist Church of Franklin, Kentucky	n = 46
AARP, Franklin, Kentucky	n = 46

High Street Nutrition Center, Bowling Green, Kentucky	n = 12
Franklin Nutrition Group	n = 22
Cave City Nutrition Group	n = 27
Bowling Green Foster Grandparents	n = 78
Metcalfe County Lion's Club	n = 25
First Christian Church, Bowling Green, Kentucky	n = 11

2) Smoking Cessation

Smoking cessation groups were carried out in three community locations during FY 1987–88. A total of 52 persons enrolled in these classes and 37 (71%) had stopped smoking by the end of the course. Adding the smoking cessation program conducted at Eaton Corporation of Bowling Green makes a total of 66 people enrolled and 49 (74%) stopped. The smoking cessation data is listed by site below.

Site	Enrolled	Stopped Smoking
Eaton Corporation of Bowling Green	14	12 (86%)
Logan County Community Class	18	13 (72%)
Bowling Green Parks and Recreation	22	20 (91%)
Bowling Green Community Group	12	4 (33%)

3) Industry Wellness

The BRDHD provided industrial wellness services to the employees of five employers during FY 1987–88. In addition, consultation and technical assistance was provided to seven additional employers. In some cases, this assistance was in support of existing wellness programs, while in others it was provided to companies seeking to initiate a program. The following is a brief discussion of the services provided for the five work sites.

Eaton Corporation (Glasgow): The project staff screened and counseled 456 of the industry's 500 employees. A second hypertension screening was provided at a later date and a hypertension education class was provided for 260 employees. Also, a weight control program was provided for 13 employees. Statistical evaluation of the resulting data revealed that participants significantly improved their nutrition and exercise habits, demonstrated a significant increase in knowledge related to nutrition, exercise, and weight loss, and experienced a significant reduction in body weight (mean weight decreased from 181.3 lbs. to 168.5 lbs. during the course of the intervention). Because of the small sample size, an alpha level of 0.10 was used for the weight control group. Statistics were not reported due to a missing data set.

Additional interventions in the areas of coronary risk reduction, smoking cessation, and seat belt usage were requested by this employer and were scheduled.

Logan Aluminum Corporation: Four hundred sixty employees of this company's 600 employees were screened and counseled. The BRDHD also provided breast cancer education to 100 employees and seat belt education to 30 employees.

General Motors Corvette Assembly Plant: The BRDHD provided screening and counseling for the EDP division (n = 18) located at this work site. The project staff consulted with management concerning follow-up interventions for this population.

Logan Memorial Hospital: The BRDHD provided health risk reduction counseling to 84 hospital employees. The project staff worked unsuccessfully with hospital staff in trying to conduct intervention programs for their employees.

Eaton Corporation (Bowling Green): Screening and counseling was provided for 66 employees. Pre- and post-Health Risk Appraisals for a previously assessed pilot group of 50 employees were evaluated. These instruments were administered at approximately a one year interval during which the company conducted an intensive seat belt education program. Only seat belt usage showed a statistically significant improvement from pretest to posttest. Statistics were not reported due to missing data.

Meta-analysis

To further clarify and summarize the results of two programs studied, the Medical Self-Care Course (MSCC) and smoking cessation program, additional analysis was conducted. The quantitative results of the MSCC were transformed into the common metric of a standard score. To achieve this for the MSCC, the absolute difference between the experimental group's pretest and posttest scores were divided by the pretest standard deviation of the control group (Table 3). Mean standard scores for all measures in each study were combined into an overall grand mean.

For the three MSCC used for this analysis, the grand mean was 1.240673. This means that the average improvement in the experimental groups was more than 24% above one standard deviation in the control group scores. This information suggests an increase in health knowledge for program participants.

For the smoking cessation program, all participants were combined. The number of participants who quit smoking were divided by the total number of participants (Table 4). A total of 96 participants quit smoking for an overall 51% program success rate.

CHAPTER IV

Conclusion

The evaluation results suggest a generally successful HERR demonstration. Seventy-six percent (n = 13) of the 17 interventions which were evaluated showed statistically significant gains in health knowledge. Out of the 21 interventions which measured specific behavioral risks, 67% (n = 14) suggested positive changes in the participants' self-reported behavior. The most significant increase in health knowledge along with some attitude and behavior change occurred among the following programs: 1) Head Start children, 2) Day Treatment for Juvenile Offenders, 3) Elementary School Teachers, 4) Medical Self-Care Course–Health Action participations, 5) Girls' Club; and 6) Industry Wellness. The smoking cessation program's short-term success rate for participants ranged from 33% to an impressive 74%.

In combining small groups to further study program results, the meta-analysis conducted on three of the Medical Self-Care Courses and all of the smoking cessation programs demonstrated positive results. Participants showed an increase in health knowledge and cessation in smoking behavior, respectively.

The evaluation of these HERR programs indicate that community-level health education activities can be successful. However, it is also important to discuss several methodological problems which were encountered during the evaluation of these programs. The problems discussed below complicated

the program evaluation process and may have obscured the program's full impact.

Demonstrating Causality: It is difficult to demonstrate that an intervention causes an observed change in attitudes or behaviors unless the intervention occurs under well controlled experimental conditions. In field research, the criteria for "pure experiments" are seldom met because subjects (participants) are self-selected as opposed to randomly selected, attrition affects treatment intensity in uncontrollable ways, and the intervention is only one of several sources of health related information to which subjects are exposed (others include television and other media, and information from physicians and other health professionals, friends, relatives, etc.). In light of these limitations, it is seldom possible to "prove" that health education produces changes in attitudes, behavior, or knowledge in the sense that classical experiments demonstrate causality. Well planned and carefully conducted program evaluation can, however, give a reasonable indication of the impact of health education on the attitudes, behaviors, and health knowledge of recipients.

Controlling for Maturation: Health related information is widely disseminated through the news and entertainment media, through word of mouth communication and through various publications, nutrition programs, fitness programs and other commercial offerings. This raises a concern that changes observed in attitudes, behavior, and knowledge among participants in a health education/risk reduction intervention may be due, in part, to input from sources external to the intervention. This problem is frequently referred to as the "maturation effect": i.e., the tendency for experimental subjects to improve on the dependent variable(s) over time for reasons external to the treatment. The classical solution for the maturation problem is to administer

the study instruments, pre and post, to a control group which receives no treatment. Presumably, improvement on the dependent variable(s) by controls provides a measure of extraneous influences, and subtracting any improvement measured in the controls from that measured in the treatment group will control for maturation. In order to insure comparability of treatment and control groups on demographic, educational and other variables which might influence the dependent variable(s), it is common to match and/or randomly assign subjects and controls on the basis of select characteristics.[39]

In practice, control groups are often difficult to select and attrition rates are frequently higher among controls than among subjects unless some compensation is given for the time and effort required to participate. During the FY 1980–81 through 1982–83 grant years, control groups were utilized in evaluating most interventions. This practice was subsequently dropped for the following reasons. First, it was difficult and time consuming to locate and survey controls who were reasonably similar to the treatment groups. Second, attrition among controls was high, especially on follow-up. This results in small, non-comparable groups unsuited to rigorous statistical analysis. Third, the comparisons between pre and posttest scores for control groups indicated that maturation was not a serious problem for the interventions being evaluated. For these reasons, continued use of control groups was not judged to be cost-effective and the program evaluation was continued using only pretests and posttests in treatment groups with some long-term follow-up.

The Problem of Small Group Size: Inferential statistics are best applied in situations where a reasonably large number of subjects are involved. In general, when comparisons are made between small groups, differences will

be found to be statistically significant only if they are very "large," meaning that the observed changes on the dependent variable(s) are substantial. As a result, applying statistical tests of significance in groups of 30 or less constitutes a rigorous test of the treatment applied. This is especially true if the alpha level is set at 0.05 or lower.

The nature of the HERR program is such that numerous small groups were utilized. This is primarily because large groups make meaningful exchanges and student participation difficult. It is generally agreed that health education is more effective when its message can be personalized and addressed to needs and interests of individual participants.[40, 41] While small groups may maximize the learning of health education, however, they are not well suited to its evaluation because they contribute to low statistical power and because they do not allow for the grouping of participants to control for treatment intensity. Treatment intensity differs across subjects when participants vary in the number of treatment sessions they attend. It is desirable to control for differences in intensity by grouping subjects according to the number of sessions they attend, and measuring change in the dependent variable within each group separately. When the dependent variable improves with treatment intensity, it adds further evidence of treatment effectiveness. Grouping is not possible with small numbers, however, because any subdivision will render the sample size unacceptably small for statistical analysis. Failure to control for treatment intensity dilutes treatment effects because the evaluator is forced to classify persons who attended all treatment sessions and persons who attend only a few as being in the "treatment" group for analysis purposes.[42] The application of meta-analysis may prove valuable in addressing the problem of small sample size

by, in effect, combining several intervention groups into a single evaluation group.

The Problem of Attrition: Self-selected subjects attending a free health education program with multiple sessions may miss one or more sessions for reasons of illness, conflicting commitments, transportation problems, etc. These problems may be more severe in some target populations than in others. In particular, transportation may be more of a problem among low income participants, a major target population of the HERR program.

When interventions limit enrollment to relatively small groups in order to have manageable sized groups for instructional purposes and significant attrition occurs, the numbers of persons completing the course and/or the posttest may be reduced to the point that statistical analysis is unlikely to be meaningful.

The Problem of Demonstrating Behavior Change: Program evaluation of health education interventions usually measures change in knowledge, attitudes, and behavior. Measuring changes in health related knowledge is relatively straightforward. Pretests and posttests based on the instructional information provides a satisfactory measure of knowledge gained. Retention over time can likewise be measured by follow-up questionnaires.

Attitudinal change can be assessed in a similar manner, but usually less change will be observed because attitudes are more difficult to measure (for example, the wording of attitudinal questions can influence the nature of the response). Attitudes are also believed to be multidetermined and resistant to change. Thus, while presenting information in an appropriate manner will usually result in gains in knowledge, the presentation of information may or may not influence related attitudes. In addition, some persons are especially resistant to attitude change for reasons pertaining to lifestyle, previous

learning, etc. (for example, smokers are often more resistant than non-smokers to messages aimed at changing smoking-related attitudes). For these reasons, assessing the success of a program on the basis of attitude change is a more strenuous measure of its effectiveness than evaluating the program on the basis of knowledge gained.

Indicators of behavioral change are the most strenuous measures of program impact for health education/risk reduction programs. Health-related behaviors are a complex and multidetermined phenomenon which are only partially understood.[43] In addition, some health habits (for example smoking, overeating, and some forms of substance abuse) are addictive and/or offer strong and immediate gratification, although their long-term consequences are deleterious. Self-reinforcing behaviors are resistant to change and when change does occur, it often takes the form of gradual changes in the habit, rather than abrupt and drastic changes. For example, some smokers may be able to reduce their exposure to tar and nicotine by switching to a milder cigarette, smoking less frequently, or inhaling less deeply. Evaluation of a smoking cessation program which asks only whether participants smoke or do not smoke on the pretests and posttests might reveal no change in smoking behavior when in fact more subtle changes have occurred.

When attempting to measure behavior change resulting from health education, three major problems confront the evaluator. First, the small group size makes statistical analysis difficult. This problem is present when evaluating knowledge and attitude change as well, but because behavior change is likely to be less dramatic, the problem is more acute. Second, during a community-based intervention, the evaluator is not able to observe the participants' behavior outside the program setting. Third, in order to

detect small changes in health behaviors, several questions pertaining to the same behavior or habit must be asked. When a broad program which provides instruction pertaining to several areas of lifestyle is being evaluated, attempts to incorporate sensitive measures of behavior change can result in excessively lengthy questionnaires. Long questionnaires result in lower response rates, especially in follow-up surveys as well as higher evaluation costs. Evaluation of behavioral change must always strike a compromise between the need to detect subtle change and the need to keep the evaluation process practical and affordable.

Evaluation as a Feedback Process: For the reasons discussed above, traditional evaluation which seeks to measure change in knowledge, attitudes, and behaviors probably underestimate the impact of small group interventions. It is important, therefore, to measure a number of variables related to program evaluation including utilization levels and to develop specific and quantifiable objectives which allow program coordinators to assess the performance of individual interventions and understand factors which contribute to their success or failure. Program evaluation thus becomes a continuous feedback process which supports program planning and allows program coordinators to allocate limited resources most efficiently. The principles of sensitive evaluation, objective-specific evaluation and the use of program evaluation feedback as an input into program planning have guided the program evaluation of the BRDHD's HERR Program.

Many of the HERR interventions have been or could be replicated elsewhere and some have generated materials which other projects can employ. Examples include: 1) Hale and Hardy's Helpful Health Hints curriculum for preschool children, 2) Medical Self-Care Course–Health Action,

3) Juvenile Offenders health education, 4) smoking cessation, 5) school teachers' workshop, 6) health fairs, and 7) Industrial Wellness. Since 1985, the BRDHD has printed and sold 195 copies of the preschool health education curriculum and Western Kentucky University's Department of Health and Safety continues to conduct the school teachers' workshop during its summer sessions. In addition, the Industry Wellness program has become self-supporting by contracting with interested area employers for an individualized wellness program. The health department's fee-for-service is reasonable since the amount billed only covers the agency's cost to provide this service. Since each program is individualized to meet each company's needs, there is not an automatic, preset price.[44]

Based on the experience gained from the HERR programs reviewed in this study, there are several basic recommendations for future application of health education activities conducted by public health agencies: 1) It was an asset to the BRDHD to have professionally trained health educators on staff to coordinate the HERR projects. Without appropriately trained staff, the project's planning process, implementation, and evaluation component would be lacking an essential element needed for program success; 2) In the beginning of the planning phase, the target population must be identified and agree to participate in the proposed activity. There is no need to waste valuable resources on an unreceptive target population; 3) The success of the BRDHD's HERR projects was based on a well-planned program which included measurable objectives and an appropriate evaluation component; 4) If expertise on program evaluation is not available within an existing staff, it is imperative to seek the assistance of an evaluation consultant to identify appropriate data collection methods and analyze program results. There is no need to collect ambiguous data and/or be unable to interpret its

significance; 5) The BRDHD's health education staff have lived and worked in the community where the HERR projects were implemented. Pre-established community contacts and working relationships with other agencies proved to be an important key in program development and implementation. It is extremely important to know the community where the activities will be conducted. Other than identifying what the community needs, the researcher must also be sensitive to what is acceptable. Sound public relations are conducive for program participation as well as cooperation from and utilization of community resources.

Health education has to continually prove itself as a profession and as an important link in the health care system. Research mentioned in the first chapter of this study, as well as the results of the BRDHD's HERR projects, demonstrate the need and importance of health education.

A health department's mission is to promote and protect the health of its residents. Other than removing the health hazard, the best means of disease prevention is to educate individuals in order to enable them to adopt health enhancing behaviors and avoid behavioral risks. Health education activities need to continue and expand if the burden of behavior-related chronic and infectious disease is to be lessened. Hopefully, the results of this and other community demonstrations will contribute to the development of increasingly effective health education methods.

NOTES

[39]Higgins, "Evaluating Wellness Programs," p. 45.

[40]Lawrence W. Green et al., Health Education Planning, p. 90.

[41]David A. Bedworth and Albert E. Bedworth, Health Education, A Process for Human Effectiveness, p. 179.

[42]Earl Babbie, The Practice of Social Research, pp. 192–195.

[43]David A. Hamburg, Glen R. Elliott, and Delores L. Parron, ed., Health and Behavior: Frontiers of Research in the Biobehavioral Sciences (Washington, D.C.: National Academy Press, 1982), pp. 25–31.

[44]C. Wayne Higgins, Thomas Nicholson, and Rebecca L. Bruce, "Local Health District a Wellness Resource for Kentucky Employers," Business and Health 5 (February 1988): 38–39.

APPENDIX A

POPULATION DEFINITIONS

MINORITY TASK FORCE – An advisory committee made up of black community leaders such as NAACP, churches, etc.

HEAD START CHILDREN – Low income, preschool age children attending the Southern Kentucky Head Start Program.

JUVENILE OFFENDERS – Range from 12–17 years of age. These teens have been in trouble with the legal system to the point they are removed from their school setting and placed in an education-treatment facility. This program provides individual and group counseling as well as continuing education to apply toward their high school degree. If the participants do not follow program regulations, they are sent off to juvenile camps or prison.

ELEMENTARY SCHOOL TEACHERS – Experienced teachers K–8 grade level who are pursuing graduate level credit.

COMMUNITY – Any interested resident.

GIRLS CLUB – Low income girls age 6–17 who attend a supervised day care program.

ELDERLY – These are community participants over age 65.

INDUSTRY – Area employers interested in an organized wellness program for their employees.

MENTALLY HANDICAPPED – Mild to moderately mentally handicapped individuals attending special educational programs and/or living facilities.

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