USING SOCIAL COGNITIVE THEORY AS A FRAMEWORK FOR DESIGNING MEDICAL SELF-CARE INTERVENTIONS

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INTRODUCTION

Medical self-care (MSC) is defined as those actions taken by the layperson to deal with minor illnesses and injuries occurring at home. Evidence from a number of groups, including health maintenance organizations (HMOs), HMO participants, state agencies, community groups, and university students, suggest that MSC could contribute to a 17% to 40% reduction in the use of medical-care facilities.[1-6] To date, MSC program evaluation studies were more concerned with utilization and educational interventions without using a theoretical basis to enhance the understanding of the reasons participants use a MSC program.

Discussions of medical self-care are taking on new meaning since most of the proposed health-care reform packages highlight, to varying degrees, self-responsibility as one of several cost-containment strategies. This paper describes one attempt to evaluate a workplace education program designed to encourage appropriate self-care and thus reduce utilization of traditional health-care services.

The program described here is based on selective constructs from Bandura's social cognitive theory.[7] Vickery[8] points out that social cognitive theory (SCT) is an appropriate model for developing a MSC program. SCT suggests that an individual's likelihood to carry out a task depends upon how well the individual can perform the task (self-efficacy), how much the individual values the outcomes of performing the task (outcome expectancies), and to what degree the individual possesses the knowledge and skills needed to complete the task (behavioral capability). In addition to the principles from SCT, principles of androgogy, "the art and science of helping adults learn,"[9] were used in the development of the three educational strategies that made up this evaluation. Research in androgogy, or adult education, suggests that adults learn best through interactive workshops or independent study.[10-12] In the UPRR study, the role of these three constructs in the use of medical self-care skills was examined among two worker classification groups: blue collar and white collar.

The Educational Interventions

Three educational interventions were compared: home study, videotape discussion group and small-group problem-solving and discussion.

The employees who participated in the home-study intervention received a popular self-care handbook[13] and videotape.[14] The video explained MSC, showed how to use the book, and gave three examples of proper MSC use. Participants in the home study intervention were encouraged to read the book and use it as a resource to guide medical care in the home.

The videotape discussion group lasted one hour and was conducted at the worksite. The videotape[15] showed participants how to use the materials and gave them two examples for using the handbook. As a group, participants developed a plan of action to deal with the two self-care problems.

In the small-group problem-solving and discussion, participants were divided into small groups and used the handbook as a reference to deal with medical problems described on situation cards. The workshop leader then held a discussion of each medical problem and suggested solutions. All participants in the one-hour workshop took the book home.

The Study Population

A random sample of 300 white-collar and 300 blue-collar workers was chosen from all UPRR employees in Omaha, NE, Council Bluffs, IA, and St. Louis, MO. Worker classification was based on the Standard Occupational Classification Manual.[16] Managers, professionals, technicians, salespeople, and clerical workers were classified as white collar, while skilled craft workers, semiskilled operators, unskilled laborers, and service workers were classified as blue collar. Typically, white-collar employees at UPRR are nonunion, whereas blue-collar employees are unionized. Initially, 100 workers were randomly assigned to each of the three intervention strategies within the two worker classification groups. Three-hundred twenty-five workers declined to participate due mainly to work schedule conflict, resulting in 126 blue-collar and 149 white-collar par-

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ticipants. Refusal to participate was anticipated. One hundred workers were selected for each cell of the design allowing for refusal and still ensuring a minimum cell size of 35 based on an anticipated medium critical program effect size of 0.25 and a statistical power of 0.80.[17] Once agreeing to participate, 93% of the workers completed the two data collection activities required for this evaluation.

Evaluation Instrument Development and Design

The first survey immediately followed the intervention, and the second survey was sent 3 months later. Both surveys went to all participants. There was no pretest.

Self-efficacy, outcome expectancies, and behavior capability were the three constructs from SCT selected as the critical factors that would contribute to the success of the MSC program. These SCT constructs were the dependent variables for this evaluation. The educational interventions were the independent variables.

Self-efficacy strength and level were measured with 15 items. Self-efficacy strength measures a person's confidence in performing the behavior in question. For example, the statement, "I am confident that I could use medical self-care on myself or other members of my family to treat colds and flu," was measured using a five-point Likert scale, with 1 being "very confident" and 5 being "not at all confident." Self-efficacy level refers to the ability to perform a certain behavior at varying degrees of difficulty. The same 15 conditions used to test self-efficacy strength were listed. Participants were then asked to note which of three behaviors — treat at home, call doctor for advice, or visit doctor — they would choose for each condition.

Seventeen items measured outcome expectancies, the perceived value placed on MSC. Participants used the same Likert scale to quantify how much they valued the ability to treat the same conditions as listed under the previous paragraph. Two general questions were also included.

Behavioral capability measured knowledge of MSC. A 16-item multiple-choice test was used. The items were based on the handbook and dealt with a variety of MSC topics. The scoring was dichotomous — an answer was either correct or incorrect. A sample question is listed below.

A cold can be prevented by:
a. washing your hands frequently, especially when you are around people with colds.
b. taking antibiotics when symptoms first appear.
c. visiting a physician when symptoms first appear.
d. dehumidifying your bedroom.

One point was given for correct answers and two points for incorrect answers. Scores could range from 16 to 32, and a low score was desirable. The evaluation instrument was based on Bandura's[7] recommendations. The initial instrument was reviewed and revised by experts in health education and MSC for face validity. The revised instrument was then pretested on a group of 200 UPRR employees in the California-Nevada area. Cronbach's alpha determined the instrument's reliability: self-efficacy strength (0.72), self-efficacy level (0.87), and outcome expectancies (0.91). The pretest results from the behavioral capability scale showed the questions were equally divided on their level of difficulty: five easy, six moderate, and five difficult questions.

ANALYSIS

The differences between groups on the theoretical constructs were examined using a MANOVA for self-efficacy and outcome expectancies and ANOVA for behavioral capability. Differences between worker classification groups (blue and white collar) were tested using the ANOVA procedure. Appropriate follow-up analyses were performed on significant findings.

RESULTS

A total of 275 employees participated in the three educational interventions and completed the first post survey; 93 percent completed the post-post survey. The MANOVA analysis indicated the program had an effect on SCT constructs. The statistical follow-up analysis indicated that self-efficacy strength and outcome expectancies were the two dependent variables changed by the program.

The follow-up analysis was not able to identify conclusively which of the three groups was responsible for the overall signifigance.

Worker Classification Group Differences

An analysis of the data from the two surveys (post and post-post) by worker classification compared blue-collar workers and white-collar workers. One-way ANOVAs tested the efficacy of the three intervention methods. The scores on the SCT constructs were used to determine which intervention was most effective for the two worker classifications.

The self-efficacy construct scores were not significantly different among the worker classification groups. There was a significant difference among the blue-collar workers on outcome expectancies scores (< 0.05). The videotape discussion group had the lowest score, suggesting this group valued MSC more than the other two groups. Neither self-efficacy nor outcome expectancies scores were statistically significant among the white-collar workers.

An ANOVA was conducted on the behavioral capability scores. Workers in the home-study groups scored sig-

nificantly higher (blue collar < 0.001, white collar < 0.008) than workers using the other two educational groups in both worker classification groups.

A two-way ANOVA was also performed on the behavioral capability scores to determine which intervention yielded the highest retention level for self-efficacy and outcome expectancies 3 months after the interventions were completed. The small-group problem-solving and discussion group intervention showed the greatest retention level (0.05).

DISCUSSION

Vickery[8] suggests that SCT provides the best theoretical framework for designing MSC interventions. Based on Vickery's advice, three constructs from SCT were identified as initial precursors to behavior change. It was hypothesized that if a person feels confident in performing MSC skills in a variety of situations (self-efficacy), sees value in these skills (outcome expectations), and possesses the necessary knowledge and skills to perform these activities (behavioral change), then MSC materials would be used appropriately when needed.

The results of this study suggested that each of three interventions — home study, videotape discussion and small-group problem-solving and discussion — enhanced measures of the three constructs of SCT (self-efficacy, outcome expectancies, and behavioral capacity) studied. The statistical analysis suggested that the interventions did significantly enhance the SCT constructs, but it was not possible to tell which intervention or interventions accounted for the significant difference.

The ANOVAs, however, did reveal some significant differences. Participants in the home-study group scored significantly higher on the behavioral capability measure than those in the other two interventions for both worker classifications. While there were no instructions given to any of the participant groups on how to answer the surveys, the behavioral capability portion required knowledge of MSC. The home-study group probably took the time to look up the answers in the book. This claim is based on informal feedback.

Outcome expectancies refer to the value placed on the ability to perform a certain behavior. Blue-collar workers in the small-group problem-solving and discussion group scored significantly higher than the other blue-collar groups. There was no difference among the white-collar groups.

Based on these results, it appears the small-group problem-solving and discussion group was most effective for the blue-collar railroad workers. The small-group problem-solving and discussion group scored highest on two of the SCT constructs (level and strength of self-efficacy and outcome expectancies), although the differences were not statistically significant. The small-group problem-solving and discussion group also had the highest score on the outcome expectancies section of the survey and the highest retention level after 3 months.

For white-collar workers, the home-study group stood out as the most effective intervention. Although not statistically significant, the home-study group scored highest on self-efficacy (level and strength) and outcome expectancies. The home-study group also scored best on the behavioral capability portion of the survey. From these results, it can be argued that the home-study option was the best intervention for white-collar railroad workers.

Vickery[8] suggests that a low-cost method of disseminating MSC materials, such as the home-study option, is enough to show differences in medical-care utilization. The results from this study suggest that some study of the handbook, requiring no employer time or personnel, did increase behavioral capability scores.

The results suggested here support Vickery's[8] conclusions, at least in terms of behavioral capability, which emphasizes actual knowledge of what to do in specific instances when medical self-care is an appropriate response. Based on informal feedback, the home-study group scored well in behavioral capability measures because the participants used the book to look up the answers when completing the evaluation survey. In other words, the interaction between the survey and the educational method affected the results. If this is the case, future uses of the home-study method would need to duplicate the survey conditions to stimulate book use. If other methods were used, such as the small-group discussion method, then similar incentives to use the book should be incorporated into the program.

The results obtained from this sample of railroad workers suggests that the blue-collar employees would respond best to the aforementioned SCT theoretical constructs by participating in the small-group workshop format, whereas, the independent study method would achieve similar results among white-collar workers. It should be emphasized to both groups that the MSC book should be used to answer any questions to increase MSC knowledge, which may lead to greater confidence and value in performing MSC skills.

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