

HEALTH LOCUS OF CONTROL AND CHRONIC DISEASE: AN EXTERNAL ORIENTATION MAY BE ADVANTAGEOUS

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A total of 62 cancer chemotherapy patients completed the Multidimensional Health Locus of Control (MHLC) scale prior to receiving training in progressive muscle relaxation and/or biofeedback for the reduction of the side effects of their treatment. Physiological measures of arousal and patient-reported indices of negative affect and nausea were collected during baseline, training, and follow-up chemotherapy sessions. Results indicated that following relaxation training and/or biofeedback, chemotherapy patients with a high external health locus of control orientation, as compared to patients without such an orientation, had lower levels of physiological arousal and reported less negative affect. These findings suggest that in medical situations in which little personal control is possible, an external health locus of control may be advantageous.

It has frequently been reported that people with an internal locus of control orientation tend to profit more from psychological interventions than people with an external orientation (e.g., Carlson, 1977; Johnson & Meyer, 1974). One explanation for this result is that internally oriented people are more likely to desire control and to be more motivated to engage actively in efforts that will allow them to gain or regain control. While such motivation may be characteristic of physically healthy or acutely ill individuals, it is very possible that it does not apply to chronically ill individuals. Wortman and Dunkel-Schetter (1979), for example, suggest that internally oriented patients with chronic disease

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may come to feel frustrated and helpless because of their inability to change their health status appreciably. In contrast, externally oriented individuals may maintain a more positive psychological state, because they do not try to control their environment, and therefore do not experience high levels of frustration. Given this situation, externally oriented patients may be more receptive than internally oriented patients to advice from health professionals and, as a result, may be more likely to play a productive role in promoting their health care. In a recent investigation that addressed the relationship between locus of control orientation and the impact of a psychological intervention, Weisman, Worden, and Sobel (1980) reported that internally oriented cancer patients benefited more than did externally oriented patients from a psychosocial counseling intervention. Unfortunately, locus of control orientation was not measured empirically but was judged subjectively by the therapist, reducing considerably the confidence that can be placed in the results of this study.

Cancer is a chronic and frequently terminal disease over which patients have little control. Moreover, many cancer patients receive chemotherapy, which may cause a variety of side effects, including severe gastrointestinal problems such as nausea and vomiting and sharp mood alterations involving increased anxiety and depression (e.g., Golden, 1975). For many patients, these pharmacologically caused side effects can lead to the development of conditioned side effects, in which stimuli associated with the chemotherapy process (e.g., the sight of the nurse or the smell of the drugs) become capable of eliciting such responses such as nausea, vomiting, and intense anxiety (Redd & Andresen, 1981). Unfortunately, antiemetic and anti-anxiety medications have not been effective in eliminating conditioned side effects for most patients (Laszlo, 1983). As a result, several investigators have studied the effectiveness of such behavioral techniques as progressive muscle relaxation training and biofeedback in reducing the conditioned side effects resulting from chemotherapy. Overall, the data generated by these behavioral investigations have been uniformly positive and suggest that such interventions can reduce or in some cases completely eliminate conditioned responses to chemotherapy (see Burish & Carey, 1984).

Although behavioral interventions have helped many cancer patients to overcome conditioned side effects, they have not been beneficial for all patients. In fact, in some studies, as many as one-third of the patients show little response to behavioral intervention on specific outcome measures (e.g., Lyles, Burish, Krozely, & Oldham, 1982). It is possible that individual differences may play a role in determining which cancer patients are most likely to benefit from such interventions;

however, there are no published data on this issue. The purpose of the present study was to assess whether a cancer patient's health locus of control orientation might be associated with his or her response to behavioral self-control interventions in the chemotherapy situation.

METHOD

SUBJECTS

A total of 20 male and 42 female outpatients receiving cancer chemotherapy participated as treatment subjects in one of three prior investigations (Burish & Lyles, 1981; Burish, Snyder, Shartner, Carey, & Krozely, 1984; Lyles *et al.*, 1982) assessing the effectiveness of progressive muscle relaxation training, electromyographic (EMG) biofeedback, and/or skin temperature biofeedback in reducing the conditioned side effects of chemotherapy. Patients ranged in age between 18 and 69 ($M = 43.90$, $SD = 15.84$). The following types of cancer were represented in the sample: 16 breast, 9 ovarian, 9 Hodgkin's, 8 testicular, 6 lung, 3 sarcoma, 2 melanoma, 2 leukemia, and 1 other.

In each of the previous investigations, the behavioral interventions were found to be significantly more effective than either placebo or no-treatment control procedures on a variety of dependent measures. Moreover, separate analyses on the behavioral interventions across studies indicated that they were generally equivalent in their effectiveness. For the purpose of the present study, all patients receiving behavioral interventions in the prior studies were combined into a single sample.

MEASURES

Multidimensional Health Locus of Control

The Multidimensional Health Locus of Control (MHLC; Wallston, Wallston, & DeVillis, 1978) test, an 18-item questionnaire, includes one Internal scale and two External scales: (1) Powerful Others and (2) Chance. Each scale contains 6 items scored on a 6-point scale, ranging from "strongly agree" to "strongly disagree."

Physiological Measures

Pulse and blood pressure levels were recorded immediately after each chemotherapy treatment.

Multiple Affect Adjective Check List

A shortened version (see Burish & Houston, 1979) of the Multiple Affect Adjective Check List (MAACL; Zuckerman, Lubin, Vogel, & Valerius, 1964) was administered following each of the chemotherapy treatments, immediately after the physiological measures were obtained. The MAACL provided a self-report index of patients' feelings of anxiety (AACL), anger or hostility (HAACL), and depression (DAACL) at the end of the chemotherapy treatment.

Postchemotherapy Rating Scales

Immediately after the postsession MAACL was completed, patients were asked to rate, on 7-point scales ranging from "not at all" to "extremely," the extent to which they felt anxious and nauseated during the chemotherapy treatment.

PROCEDURES

The procedures for each of the three studies were similar and have been described in detail elsewhere (Burish & Lyles, 1981; Burish *et al.*, 1984; Lyles *et al.*, 1982). In summary, after signing an informed consent form to indicate voluntary participation in the study, patients were asked to complete the MHLC scales. They then underwent a baseline chemotherapy session during which no behavioral intervention was administered. During this session, the chemotherapy was administered in the usual fashion, after which the various dependent measures were collected. During the next two or three chemotherapy sessions, the behavioral interventions were used. Patients were given relaxation training and/or biofeedback beginning approximately 30 minutes before, and continuing throughout, the chemotherapy treatments. Patients were told that relaxing and controlling their physiological responses were learned skills that would help to reduce the unpleasantness of the chemotherapy. After the chemotherapy infusion was completed, the behavioral intervention was stopped and the dependent variables were collected. Patients were asked to practice relaxing at home between sessions. After the final training session, patients were given a follow-up session, during which they were asked to relax on their own during chemotherapy but were not provided with relaxation instructions or biofeedback.

RESULTS

Prior to the major data analyses, three preliminary procedures were conducted. First, separate median splits were computed for each of the three MHLC scales, creating "high" and "low" groups. Second, separate one-way analyses of variance (ANOVAs) were carried out on each of the dependent measures collected during the baseline chemotherapy session, in order to determine whether there were any initial differences among groups. No significant differences were found between high and low groups for any of the dependent measures. Finally, in order to control for the toxicity of the different chemotherapy protocols that patients received, difference scores were calculated for each dependent measure. These scores were calculated by subtracting the score of the baseline session from the score of the final training session and the follow-up session. Thus, a negative score indicated a decrease from baseline level, whereas a positive score indicated an increase from baseline level.

Following these preliminary procedures, separate one-way ANOVAs with two levels (high and low) were calculated for each scale of the MHLC for each dependent measure collected during the training and follow-up sessions. Analyses involving the Powerful Others scale revealed that patients who scored high on this scale were significantly less depressed during both the final training session ($M = .91$) and the follow-up session ($M = .73$) than patients who scored low on the scale (M 's = .88 and 1.17), F 's (1, 60) = 4.34 and 4.25, both p 's < .05.

Analyses of the Chance scale revealed that patients who scored high exhibited significantly lower pulse rates in both the final treatment and follow-up sessions (M 's = -5.21 and -6.13) than patients who scored low (M 's = 1.28 and 1.77), F 's (1, 60) = 5.08 and 6.82, both p 's < .05. Patients scoring high on Chance also displayed significantly lower levels of diastolic blood pressure (M 's = -6.45 and -6.20) than patients scoring low on chance (M 's = .5 and .4) at both the last training session, F (1, 60) = 4.80, p < .05, and the follow-up session, F (1, 60) = 4.87, p < .05.

Analysis of the Internal scale revealed that patients with a high score on this scale had significantly lower pulse rates ($M = 4.2$) during the last training session than did low scorers ($M = 2.5$), F (1, 60) = 4.98, p < .05, but that this effect disappeared by the follow-up session, F (1, 60) < 1. Moreover, patients scoring high on the Internal scale tended to report feeling more postsession anxiety ($M = .19$) than patients scoring low on this scale ($M = 1.83$) during the final training session, F (1, 60) = 3.02, $p = .08$.

DISCUSSION

The results suggest that some chronically and/or terminally ill patients with an external health locus of control orientation (i.e., patients who score relatively high the Powerful Others and/or Chance subscales of the MHLC) may profit more from such behavioral interventions as relaxation training and biofeedback than patients without such an orientation. Specifically, the results indicated that within a cancer chemotherapy context, patients who scored high on one or both of the External MHLC scales showed significantly greater improvement on measures of pulse rate, blood pressure, and depression at the end of the training and during followup than did patients scoring low on these scales. In contrast, patients scoring high on the Internal scale tended to report feeling more anxious at the end of training, although they also showed a lowered pulse rate at this time.

Although there was a pattern of increased benefit for externally oriented patients on the MAACL and physiological measures, it should be noted that MHLC scores were not associated with differences in nausea levels. Behavioral interventions tend to reduce nausea levels significantly in most patients (see Burish & Lyles, 1981; Burish *et al.*, 1984; Lyles *et al.*, 1982), and what variance that does occur in this measure is apparently not related to patients' MHLC scores. Thus, although health locus of control orientation may be an important individual difference factor for some areas of patient responding, it does not appear by itself to be associated with all response categories.

The data also suggest that internal locus of control beliefs may be maladaptive in some areas for some cancer patients if, in the course of dealing with a relatively uncontrollable chronic disease, they are offered an intervention whose effectiveness depends in part on their exercising control and responsibility. As Wortman and Dunkel-Schetter (1979) have suggested, such patients may be anxious and despondent about their loss of control over their health, and as a result may not take advantage of treatment opportunities that arise. Nagy and Wolfe (1983) have also presented data to suggest that in order to adapt to an environment in which personal control is difficult or impossible to obtain, chronically ill individuals may modify their health locus of control orientation over time in the direction of increased externality. Presumably, an external orientation reduces the distress associated with a lack of control and increases the likelihood that patients will readily follow the advice of the medical staff (powerful others) regarding treatment and life style changes. These speculations and the data from the present study suggest that, contrary to what has generally been as-

sumed, an external orientation might have some advantages for patients suffering from certain chronic diseases.

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