Health-Promoting Variables as Predictors of Response to a Brief Pain Management Program

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Abstract: This study investigated the value of the sense of coherence (SOC), self-esteem, and the Mental Health Inventory subscales as predictors of response to a brief pain management program. One hundred and seven chronic pain patients who participated in a pain management program, which included education about pain, relaxation training, and stress management, were sent a follow-up questionnaire 6 months after the course. Reported pain intensity since the course was significantly associated with SOC subscale meaningfulness. The use of relaxation and other techniques taught in the course was correlated with positive affect and well-being. The results suggest that health promoting variables may offer advantages over pathological measures as predictors of patient response to pain management programs, and SOC is worthy of further study. Key Words: Pain-Health-promoting variables-Sense of coherence.

There is a need to identify those factors associated with treatment response in chronic pain patients in order that treatment may be more effectively targeted. To date, studies predicting the treatment response of chronic pain patients from psychological factors have largely employed traditional psychometric measures of psychopathology.

The most commonly investigated psychological scale in studies with chronic pain populations has been the Minnesota Multiphasic Personality Inventory (MMPI). Overall, the MMPI has shown inconsistent results in predicting patient response to medical and psychological intervention procedures (1-4), as well as more formal pain management programs (5-7). The Million Behavioral Health Inventory (MBHI) was designed to assess relevant psychological factors in medical settings. One subscale was specifically designed to predict pain patients' responses to treatment. However, validity studies carried out with the MBHI have shown mixed results and have failed to clearly support its validity in pain populations (8-10).

Recently, researchers have begun to look at the relationship between positive psychological variables that promote coping and health outcomes. Antonovsky (11) has argued that researchers would do well to examine people who remain healthy and do not succumb to illness. He asserts that the variables related to health may indeed be qualitatively different than those associated with pathology and sickness. Sense of coherence (SOC) is a construct proposed by Antonovsky (12) as being related to effective coping and good health. SOC is defined as a personal orientation that is composed of three factors: meaningfulness, manageability, and comprehensibility. The person with a high level of SOC sees their life as meaningful and having some purpose. They also see themselves as having the resources to cope with demands that are placed on them. Furthermore, they see the world as being understandable and making sense to them. The relationship between SOC and health outcomes has so far been supported in a small number of investigations (13,14). Sense of coherence shares similarities to earlier constructs, such as Bandura's self efficacy model (15). Self-efficacy is the belief that one is the sort of person who will accomplish one's goals. Previous research has suggested that self efficacy may be related to outcome in chronic pain patients (3).

The present study investigated the ability of sense of coherence to predict patients' responses to a brief chronic pain management course at 6 months. The study further examined the predictive utility of both the positive and negative dimensions of the Mental Health Inventory and self-esteem.
METHOD

Subjects
The subjects were 107 chronic pain patients (82 women and 25 men) attending one of a series of brief pain management courses. Subjects were referred to the weekend pain management course by local medical practitioners and hospital pain clinics. The average age of subjects was 54.7 years (SD 13.9). Thirty-five percent of patients had low back pain or sciatica, 23% had neck, shoulder, or head pain, 18% had joint or rheumatoid pain, and a small number had pain in major limbs (4%). The mean number of years with chronic pain was 11.9 (SD 10.1). Sixty-four patients were currently taking medication for their pain. Six of the sample were receiving earnings-related compensation for their pain.

Procedure
Before beginning the pain management course patients completed the following psychological scales.

Mental Health Inventory (16)
This test is a measure of overall mental health and comprises two relatively independent dimensions representing both positive and negative states of overall mental health. The negative states include subscales measuring anxiety, depression, and emotional instability, whereas the positive dimension consists of a measure of general positive affect and emotional ties. Results from large general population studies support the factor structure of the scale and demonstrate high levels of stability and internal consistency (16).

Coopersmith's Self-Esteem Inventory
This scale for adults is based on Coopersmith's (17) earlier self-esteem test for children. It has been found to be significantly correlated with other self-esteem measures and has received factor analytic support for its validity (18).

Sense of Coherence Scale (13)
This is a 29-item test designed as a measure of Antonovsky's sense of coherence concept. The scale measures three dimensions: manageability, meaningfulness, and comprehensibility. Reports summarized in Antonovsky (12) suggest that it is a valid and reliable measure.

Pain Behavior Checklist
This is a scale developed from behavioral items commonly endorsed by chronic pain sufferers. The scale consists of 49 items measuring avoidance, complaint, and help-seeking behavior and has been shown to be a valid assessment measure of the behavioral consequences of chronic pain (19).

The Pain Management Course
This brief program uses a group format of 12-20 patients and combines education, stress management, and relaxation training components over a 2-day period. The education module covers simple neurophysiology, the nature of pain, including the gate control theory, and an explanation of traditional pain therapy. The stress management module discusses the relationship of stress to pain, time management principles, and the relationship of pleasant events to mood. Relaxation training and simple biofeedback demonstrations are conducted to promote the individual's sense of control in their own recovery. Workbooks and relaxation tapes covering the various aspects of the course are kept by the participants.

Follow-up
After 6 months, subjects were sent a follow-up questionnaire that asked them to rate their overall pain intensity since the course, as well as their level of physical activity and use of the relaxation and other techniques taught in the course. Subjects were also asked to complete a further Pain Behavior Checklist.

RESULTS

Seventy-three subjects (68%) responded to the follow-up questionnaire. The distribution of reported pain level since the course was as follows: none or hardly any (15.1%), some but much improved (30.1%), slightly better (16.4%), same as before (28.8%), worse than ever (9.6%). Overall, 45% of subjects reported they were much improved since the course. Subjects were also asked to rate their level of activity since the course and their use of the relaxation exercises and other techniques taught in the course. These results are presented in Table 1. Subjects who responded to the follow-up questionnaire did not significantly differ from nonrespondents on age, gender, pain site, or on any of the scales in the patient questionnaire.

| TABLE 1. Level of physical activity and use of relaxation techniques and other methods taught in the course |
|---------------------------------------------------------------|------------------|
| Physical activity                                             | Percentage       |
| Much more active                                              | 28.8             |
| A little more active                                          | 28.8             |
| About the same                                                | 34.2             |
| A little less active                                          | 4.1              |
| A lot less active                                             | 4.1              |
| Use of relaxation and other techniques                        |                  |
| Very often or always                                          | 5.5              |
| Regularly                                                     | 42.5             |
| Sometimes                                                     | 35.6             |
| Seldom                                                        | 12.3             |
| Very seldom or never                                          | 4.1              |
A stepwise multiple regression analysis was conducted using the psychological variables as predictors of pain intensity at 6 months. Only the SOC subscale -meaningfulness- entered the regression equation using the standard default probability of 0.05. The overall $R^2$ was 0.11 ($F = 10.15, p < 0.01$).

The relationship between the predictor variables and activity level at 6 months and the use of relaxation and the other methods taught in the course was examined. None of the psychological predictors were significantly correlated with activity level at 6 months. The regular use of relaxation and the other methods taught in the course was significantly correlated with positive affect (0.40, $p < 0.01$) and the level of well-being prior to the course (0.39, $p < 0.01$).

A further stepwise regression analysis was conducted predicting the improvement on the Pain Behavior Checklist from prior to the course to the 6-month follow-up. The Pain Behavior Checklist measures the behavioral responses of avoidance, complaint, and help-seeking behavior. Only one predictor variable, the MHI subscale ‘general positive affect’, entered the equation. The $R^2$ was 0.17 ($F = 8.90, p < 0.01$).

**DISCUSSION**

The results support the proposition that health promoting variables may have value in predicting response to pain management programs. The results further suggest that variables such as sense of coherence may offer increased accuracy in identifying patients likely to respond to pain management courses than do traditional psychopathological variables, such as anxiety and depression.

Examining the sense of coherence construct itself, it seems that an individual’s level of meaningfulness has the most value in identifying individual response. Meaningfulness is defined by Antonovsky as seeing life tasks and problems as challenges worthy of engagement (12). Meaningfulness significantly predicts reported pain 6 months after the course. This finding is consistent with Fordyce’s statement that “people who have something better to do don’t suffer as much” (20).

Prediction of improvement in activity level was not possible from the predictor variables. However, the continued practice of the course techniques, such as relaxation, was significantly related to higher positive affect and well-being. It seems chronic pain patients who are still managing to experience positive feelings are more likely to make use of the techniques taught in the course.

It should be noted that these findings are limited by the use of self-report data; they need replication on more intensive and longer pain management programs and should be corroborated with clinical data and reports from the patient’s family or associates over a longer follow-up period. Bearing this qualification in mind, the study suggests that sense of coherence as a health-promoting variable may have promise as a rapid way of identifying those chronic pain patients most likely to benefit from psychological interventions.

**REFERENCES**

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