Can a Back Pain E-mail Discussion Group Improve Health Status and Lower Health Care Costs?

A Randomized Study

Kate R. Lorig, DrPH; Diana D. Laurent, MPH; Richard A. Deyo, MD; Margaret E. Marnell, PhD; Marian A. Minor, PhD; Philip L. Ritter, PhD

**Background:** Given the high health care utilization, limited evidence for the effectiveness of back pain interventions, and the proliferation of e-mail health discussion groups, this study seeks to determine if the Internet can be used to improve health status and health care utilization for people with chronic back pain.

**Methods:** Randomized controlled trial. Participants included 580 people from 49 states with chronic back pain having at least 1 outpatient visit in the past year, no “red-flag” symptoms, and access to e-mail. Major exclusion criteria included continuous back pain for more than 90 days causing major activity intolerance and/or receiving disability payments.

**Intervention:** Closed, moderated, e-mail discussion group. Participants also received a book and videotape about back pain. Controls received a subscription to a non–health-related magazine of their choice.

**Main Outcome Measures:** Pain, disability, role function, health distress, and health care utilization.

**Results:** At 1-year treatment, subjects compared with controls demonstrated improvements in pain ($P = .045$), disability ($P = .02$), role function ($P = .007$), and health distress ($P = .001$). Physician visits for the past 6 months declined by 1.5 visits for the treatment group and by 0.65 visits for the control group ($P = .07$). Mean hospital days declined nearly 0.20 days for the treated group vs and increased 0.04 days for the control group ($P = .24$).

**Conclusions:** An e-mail discussion group can positively affect health status and possibly health care utilization. It may have a place in the treatment of chronic recurrent back pain.

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IN RECENT YEARS, the Internet has become a source for health information. In many cases, this information has become a source of support for people with similar health conditions. Today, there are hundreds if not thousands of health-related Internet support groups. However, few of these groups have been evaluated. Thus, this study seeks to answer the question: Can a behavioral intervention delivered via the Internet affect the quality of life and health care utilization among people with chronic recurrent back pain?

Chronic recurrent back pain is one of the most highly prevalent medical conditions. After respiratory tract infections, it is the most common symptomatic reason people seek health care. Its direct economic impact has been estimated at $24 billion, while the indirect impact may be as high as $50 billion. Although there have been many educational and behavioral attempts to affect the pain, disability, and health care utilization associated with chronic back pain, findings from previous back pain education programs have been equivocal.

Cohen et al reviewed 13 primary studies of group education for people with low back pain. They concluded in the 6 well-designed studies that there was “insufficient evidence to recommend group education for people with low back pain.”

Di Fabio conducted a meta-analysis of back schools with or without a comprehensive rehabilitation program. These programs increased strength and endurance (effect size, 0.40) and compliance (effect size, 0.27). They had little effect on utilization or lost workdays. A recent Cochrane review by van Tulder et al suggests that exercise is not useful in the acute phase of back pain but that combined exercise programs may help prevent recurrence or reduce chronic back pain.

Turner has examined cognitive behavioral interventions for low back pain. She reviewed 12 studies that used 1 or more cognitive or behavioral approach, some combined with exercise. In most of the studies, cognitive behavioral approaches seemed to
SUBJECTS AND METHODS

Subjects were recruited from workplaces, through public service announcements, and by donated Web page banners on Yahoo!, an Internet search engine. To enroll in the study, subjects were directed to a Web site that described the study. The entire enrollment process occurred through the study Web site. This Web site was accessed approximately 46000 times during the enrollment period. Of these, 2056 completed the eligibility form and of 889 eligible, 580 completed the informed consent and baseline study questionnaire. Eligibility criteria included having at least 1 outpatient visit for back pain in the past year, no “red-flag” symptoms (back pain accompanied by unintended weight loss, pain not improved with rest, back pain secondary to significant trauma, acute onset of urinary retention or overflow incontinence, loss of anal sphincter tone or fecal incontinence, saddle anesthesia, or global or progressive motor weakness in the lower limbs), access to a computer and an e-mail account, and living in the United States. Subjects were excluded if they had back pain that had continued for more than 90 consecutive days and continued to cause major activity intolerance, were planning back surgery, were currently receiving disability payments for their back pain, were unable to understand and write English, were pregnant, had back pain due to systemic disease, had a severe comorbid condition that limited functional ability, or had a terminal illness. Of the 1167 treated subjects at baseline are given in Table 1. INTERVENTION

The intervention consisted of 3 parts: a closed e-mail discussion group in which all group members received all e-mails sent by group members, moderators, and content experts; a copy of The Back Pain Helpbook®; and a videotape that modeled how to continue an active life with back pain. In the discussion group, all members received e-mail sent by any member or moderator. There was no real-time discussion. The discussion group had 2 moderators and 3 content experts, a physician with expertise in back pain, a physical therapist, and a psychologist. The moderators served as group leaders. For example, if there had been no e-mail for several days, a moderator might ask a question to stimulate interaction. Participants were not allowed to be judgmental or negative to other participants, nor were they allowed to discuss individual health care professionals. There were no other limits on discussion topics. One of the moderators maintained the technical aspects of the discussion groups, such as removing members at their request, changing e-mail addresses, notifying users of computer viruses, and troubleshooting computer problems. The content experts were available to answer general questions and comment on the discussion. They were not allowed to give individual medical advice. They estimated their online time to be 2 or less hours per week. There was no randomization. At 6 months, 202 treatment subjects (68%) and 252 control subjects (89%) completed data. At 12 months, 190 treatment subjects (64%) and 231 control subjects (81%) completed the study. During the first days of the intervention, the number of e-mails per day exceeded 150. This caused 54 treatment subjects to discontinue the intervention during the first month of the intervention. These subjects were invited back into the intervention 2 times during the first year. Of the 107 treatment subjects who requested to be removed from the intervention during the first year, 43 returned to the intervention. Data were requested from all subjects who had been randomized, irrespective of their actual participation in the intervention. Demographics of subjects at baseline are given in Table 1.

At baseline, the only significant (P<.01) difference between treatment and control subjects was that a greater proportion of the treatment (63%) had used the Internet for health information or to gain support and receive health-related advice, compared with the control group (48%). At baseline, control subjects had a mean of 13 years of education, compared with 12 years for treatment subjects. There were no group differences in variables such as age, gender, marital status, or presence of insurance. Subjects were excluded if they had back pain due to systemic disease, had a severe comorbid condition that limited functional ability, or had a terminal illness. Of the 1167 subjects entered the intervention at the same time, within 6 weeks of completing baseline data. Control subjects continued with usual care and received a subscription to their choice of popular non–health-related magazines. All subjects in both groups simultaneously completed study questionnaires 6 and 12 months after baseline.

RESULTS

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The Back Pain Helpbook was written for a previous study and emphasizes the principle that “hurt does not equal harm.” This was accomplished by discussing the Agency for Health Care Policy and Research guidelines and making recommendations for self care. The book was included as part of the intervention so that participants could have a specific reference concerning exercise and other treatments.

Finally, treatment subjects received a videotape produced by Northern California Kaiser Permanente Medical called Easing Back: Taking Control of Your Back Problem. The videotape had vignettes of several people with back pain who told their stories and discussed how they were able to live and work with back pain. The videotape did not teach specific exercises but rather emphasized posture and walking. The purpose of adding the videotape to the intervention was to provide the subjects with models of appropriate back care behaviors.

**STUDY VARIABLES**

All data were collected by self-administered questionnaires. All subjects completed the baseline questionnaire online. Ten percent requested to complete either the 6- or 12-month questionnaire by mail, and 2% completed both questionnaires by mail. Primary outcomes for this study were changes in quality of life (pain, disability, role function, and health distress) and changes in health care utilization (back-related visits to physicians, physical therapists and chiropractors, and back-related days of hospitalization). Secondary outcomes included endurance exercise, self-care orientation, and self-efficacy.

| Table 1. Baseline Data for Treatment and Control Groups and Baseline Data for Those Completing 1 Year of Treatment |
|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|
| Characteristic | All Data | 1-Year Treatment Data |
| Treatment (n = 296) | Control (n = 284) | Treatment (n = 190) | Control (n = 231) |
| Age, mean, y | 46 | 45 | 47 | 45 |
| Sex, male, % | 62 | 61 | 61 | 60 |
| Education, mean, y | 16.5 | 16.6 | 16.6 | 16.6 |
| Married, % | 67 | 77 | 71 | 76 |

percentage of control subjects were married. Examining the baseline differences between treatment and control subjects who completed 1 year, only age approached significance ($P = .05$) with the treatment subjects being older. The earlier difference in marital status disappeared, suggesting a greater tendency for unmarried subjects to discontinue the study.

During the year-long study, a total of 2399 e-mail messages were posted to the group. A total of 204 (69%) of the treatment subjects sent 1 or more e-mail messages to the group. Forty-one percent of subjects reported reading most or all the e-mail messages, while an additional 37% of the subjects reported reading only the e-mail messages of interest to them. The 211 subjects remaining active members of the discussion group at the end of 1 year posted e-mail messages a mean of 8.0 times (median, 2).

Sixty-eight percent of the subjects reported that they had watched the entire videotape, 24% had not watched it, and 18% had watched part of the videotape. Most participants reported that they had read part of the book (mean, 56%). Only 33% had read the entire book, and 12% had not read any of the book.

At 1 year, treatment subjects compared with controls demonstrated significant improvements in all 4 of the primary health status variables (pain, disability, role function, and health distress) ($P < .05$, Table 2). For health care utilization (visits to physicians, chiropractors, and physical therapists, as well as hospital days), the treatment group demonstrated greater declines than the control group. For physician visits, this approached significance ($P = .07$). Physican visits for the past 6 months...
declined by 1.54 visits for the treatment group and 0.65 visits for the control group. Mean hospital days declined nearly 0.25 days for the treated group and increased 0.04 days for the control group ($P = .24$).

Two other variables that might have influenced health status and health care utilization were also examined, self-care orientation and self-efficacy. Self-care orientation and self-efficacy were significantly enhanced in the treated group (both 9%) compared with the control group (4% and -2%) ($P = .01$ and $P = .003$, respectively). It may be that study dropouts, if included, would have significantly influenced the study outcomes. To investigate this possibility, we performed intent-to-treat analyses. The results were nearly the same as with the analyses that excluded dropouts (Table 2). Using the intent-to-treat analysis, the reduction in hospital days approached significance ($P = .08$).

In addition, baseline and 6-month changes in self-efficacy were associated with 12-month health status. Specifically 6-month changes in self-efficacy were significantly ($P < .001$) associated with 1-year changes in disability, health distress, pain interference, and role function (Pearson $r = -0.20$, $-0.33$, $-0.18$, and 0.26, respectively). Using regression models, we calculated adjusted health status variables at 1 year. Independent variables used in the model were the health status variables at baseline, self-efficacy at baseline, 6-month change in self-efficacy, and demographic variables (age, sex, education, married, and non-Hispanic white). Baseline self-efficacy and 6-month change in self-efficacy were associated with 1-year disability, health distress, pain interference, and role function at the $\leq 0.001$ level. In these models, baseline demographic variables did not significantly predict 1-year outcomes, except that older age was associated with higher levels of disability. When we added baseline self-care orientation and 6-month change in self-care orientation to the regression models, both were significantly associated with physician utilization at 1 year ($P = .02$, $P = .005$, respectively). Thus 6-month changes in self-efficacy seem to be associated with 1-year improvements in health status, while 6-month changes in self-care orientation seem to be associated with 1-year reductions in physician utilization.

This study suggests that a simple low-cost use of the Internet may improve health status and lower health care utilization for persons with recurrent back pain. The question is whether these changes are clinically significant. Fischer et al$^{17}$ found that arthritis patients rated a 30% improvement in disability as meaningful and satisfying. In this study, patients achieved a 34% reduction in disability (effect size, 0.3).

Another important question involves potential savings. When we examined utilization, the treatment group reduced their total outpatient utilization from 9.47 visits in the 6 months before baseline to 4.32 visits in months 6 to 12 of the study, for a total reduction of 5.15 visits. The control group reduced their visits from 8.55 to 5.74 for a total of 2.81 visits. Thus, the treatment group had 46% fewer visits than the control group during the last 6 months of the study. This same pattern, although not statistically significant, was observed in hospital days with the treatment group reducing hospital days by 0.20 compared with less than 0.05 days for the control group. These reductions, if replicated in other groups, could represent substantial savings because of the high utilization patterns of people with recurrent back pain. The cost of the intervention was approximately $15 per person for the book and videotape and...
approximately 11 hours per week of professional time (2 hours per week for each of 3 content experts and 5 hours a week for the moderators). Using a professional salary of $100,000/year, the total cost of the intervention per participant was approximately $100. This would be increased if the purchase of computers and software were included.

With improved health status and health care utilization, one must ask why these changes occurred. It is not possible to identify the individual contributions of the various parts of the intervention. However, we do know that most past educational interventions for back pain have been ineffective. At the same time, Turner3 has suggested that psychobehavioral interventions may be more effective in the treatment of this condition. From our data, it seems that baseline self-efficacy as well as changes in self-efficacy may be important contributors to the positive health status outcomes.

There are several caveats. It may be that those participating in the intervention were a select group. During a 3- to 4-month recruiting period, 46,000 people had at least an initial interest as indicated by hits on the study Web site. In addition, the utilization rates and disability scores of study subjects do not differ greatly from those reported in the general population. In fact, the subjects in this study may be more representative than in past studies. They came from 49 states and had a wide age range. On the other hand, we had few minority subjects and, of course, those without Internet access were excluded.

In addition, this study did not include recurrent back pain patients receiving disability compensation. This was intentional to avoid the problems sometimes encountered with the competing demands of improvement in condition with the desire to maintain disability benefits. We are currently beginning a replication study for people who have applied for workers’ compensation because of low back pain.

In conclusion, while there are many caveats and much more to be learned about the use of an Internet discussion group for persons with chronic health conditions, this is one of the first randomized studies to investigate this new delivery mechanism, to our knowledge. The results suggest that a combination of information and support largely offered through an Internet discussion group improves health status and health care utilization for up to 1 year. In the future, we will learn much more about the potential and limitations of this new media for delivering health care interventions.

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Corresponding author and reprints: Kate R. Lorig, DrPH, Stanford Patient Education Research Center, 1000 Welch Rd, Suite 204, Palo Alto, CA 94304 (e-mail: lorig@stanford.edu).

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