



# THE USE OF COMPLEMENTARY AND ALTERNATIVE THERAPIES FOR CHRONIC PAIN FOLLOWING SPINAL CORD INJURY: A PILOT SURVEY

Sangeetha Nayak, PhD<sup>1,2</sup>; Robert J. Matheis, MA<sup>2</sup>; Sandra Agostinelli, MA<sup>2</sup>; Samuel C. Shiflett, PhD<sup>1,2</sup>

<sup>1</sup>New Jersey Medical School, University of Medicine and Dentistry of New Jersey, Newark; and <sup>2</sup>Kessler Medical Rehabilitation Research and Education Corporation, West Orange, New Jersey

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## ABSTRACT

**Objective:** The purpose of this study was to determine the patterns and reasons for the use of complementary and alternative medicine (CAM) as a treatment for chronic pain among individuals with spinal cord injuries (SCI).

**Methods:** Telephone surveys were conducted in a sample of 77 people with SCI and chronic pain.

**Results:** Of those surveyed, 40.3% had used at least one CAM technique to manage chronic pain. The most common reason was dissatisfaction with conventional medicine. Acupuncture was the most frequently used modality, followed by massage, chiropractic manipulation, and herbal medicine. Acupuncture was rated lowest for satisfaction with pain relief, and massage was rated highest. Individuals not using conventional pain medication or who desired greater control over their health care practices tended to use more CAM techniques than others. Income, insurance coverage, and duration of pain were related to use of CAM. In general, CAM methods were effective for some and totally ineffective for others, indicating selective utility in this population.

**Conclusions:** Despite this small opportunistic sample, the prevalence of CAM among individuals with SCI appears similar to that in the general population. A placebo-controlled trial is needed to evaluate the efficacy of various therapies in the SCI population. The fact that the most effective therapy, massage, was not frequently used suggests the need for more awareness of and research into this technique.

**Key Words:** Spinal cord injury; Complementary and alternative medicine; Chronic pain

## INTRODUCTION

Today, most individuals with spinal cord injuries (SCI) (90%) survive to live near-normal life spans (1). Although the overall health and short-term medical care of individuals with SCI has improved, the medical management of long-term secondary complications remains a challenge. A wide range of secondary medical complications is reported among SCI survivors, in particular, pressure ulcers, urinary tract infections, bowel problems, spasticity, and pain (2).

Pain is a significant complication that interferes with functioning and the quality of life in 5% to 45% of people with pain following SCI (3). Estimates of the prevalence of chronic pain following SCI range from 18% to 64% for severe disabling pain and 48% to 94% for mild-to-moderate pain (3-7). One study found

that at 5 years postinjury, pain and spasticity were persistent complications for more than 25%, disrupting productivity, employment, mood, quality of life, social functioning, and the ability to fully participate in rehabilitation (8).

Despite the high incidence of pain following SCI, pain management is often ineffective (9). The issue of chronic pain may be overshadowed by the life-threatening nature of the injury and the magnitude of the physical disability and secondary complications that affect the long-term care of these individuals. Also, the mechanisms of chronic pain in SCI are not well understood, hindering the development of effective treatments.

A recent survey conducted in spinal injury units in the United Kingdom found that the lack of consensus regarding guidelines for pain management and lack of expertise were obstacles to effective pain management (10). Current pharmacological management of pain, eg, the use of anticonvulsants, antidepressants, and other analgesic medications, including narcotics, has been reported to be effective to a moderate degree. Few controlled double-blinded trials have investigated the efficacy of these pharmacological agents in post-SCI chronic pain. Among the general population, however, the American Pain Society found that only 45% of chronic pain sufferers who were taking narcotics felt that they had their pain "pretty much under control." Furthermore,

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Please address correspondence to Sangeetha Nayak, PhD, Department of Psychiatry, New Jersey Medical School, University of Medicine and Dentistry of New Jersey, ADMC 1404, 30 Bergen St, Newark, NJ 07107; phone: (973) 972-8304; fax: (973) 972-8305 (e-mail: nayaksa@umdnj.edu).

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chronic pain sufferers reported needing to take, on the average, 5.7 narcotic pills per day to achieve moderate pain relief (11). In addition, most pain medications are associated with adverse reactions, such as sedative and anticholinergic side effects, toxicity, and the potential for addiction and abuse (12). Other SCI pain management techniques include anesthetic and surgical techniques, the efficacy of which have been questioned because of the paucity of supporting research and their invasive nature (13,14).

Because of the impact of pain itself, the adverse effects of many pain medications, and the lack of adequate pain relief, it is plausible that a number of individuals with SCI are seeking alternative medicines. However, the prevalence of use and the kinds of therapies are not known. Although there appears to be no consensus about a formal definition for complementary and alternative medicine (CAM), the one provided by Eisenberg et al (15), based on the definition by the National Center for Complementary and Alternative Medicine, is frequently used. According to this definition, CAM refers to treatment modalities that are not provided in hospitals or recommended by the mainstream medical community and are not taught as part of the standard curriculum in most US medical schools (15). The use of CAM is on the increase in the able-bodied population, especially among those with chronic conditions. In an often-cited landmark telephone survey of the general population, Eisenberg et al (15) found that 34% of a sample of approximately 1500 people reported using at least one alternative therapy during the previous year. The majority of CAM was used for chronic, non-life-threatening medical conditions, and out-of-pocket expenditures were estimated at \$10 billion. Interestingly, 72% of those who used CAM did not inform their physicians that they had done so. This study precipitated widespread interest in CAM use and efficacy across the country. In a follow-up study, Eisenberg et al (16), found that use of alternative therapies increased from 34% in 1990 to 42% in 1997. The probability of CAM users visiting an alternative medicine practitioner increased from 36.3% to 46.3%. Just as in the 1993 survey, people were more likely to seek CAM therapies for chronic conditions such as back problems, anxiety, depression, and headaches. Out-of-pocket expenditures for CAM therapies were \$12.2 billion, an increase of 45.2% since 1990.

Three recent surveys have examined CAM use among patients with a variety of neurological disorders. In a telephone survey of 401 individuals with physical disabilities who had been receiving outpatient rehabilitation services in the New York metropolitan area, Krauss et al (17) found that 57% reported using alternative therapies. Their sample included individuals with multiple sclerosis, hemiplegia, cerebral palsy, cerebrovascular disease, tetraplegia, and paraplegia. This number is much higher than the percentage of users (42%) in the general population (16). This group was more likely to use alternative therapies than conventional therapies for pain, depression, anxiety, insomnia and headaches.

In a further analysis of the Krauss et al data, Shiflett et al (18) examined a subgroup of 79 individuals with paraplegia and tetraplegia. They found that among those with tetraplegia, exercise was the most commonly used therapy and the one that was judged to be most helpful. Among those with paraplegia, massage, imagery, herbal therapy, exercise, and relaxation were rated

as the most helpful therapies. Herbal remedies were rated highly by both groups of patients. In general, participants with paraplegia rated alternative therapies as less helpful than those with tetraplegia did. Although these findings are interesting and suggestive, inferences cannot be drawn about the pattern of alternative therapy use among individuals with SCIs because the sample included those with tetraplegia and paraplegia and a mix of diagnostic categories including chronic pain.

Meyers and his associates conducted a survey in 1996-1997 on the use of alternative and conventional health services by independently living adults with major disabilities (A. Meyers, D. Klein Walker, N. Wilber, et al, written communication, 1998). Their sample included 572 individuals with a variety of disabling conditions including SCI, cerebral palsy, multiple sclerosis, traumatic brain injury, and arthritis. (Results were not broken down by specific disability.) They found that the higher the number of conventional health care encounters or visits, the more likely the use of alternative therapies. They also found that the presence of symptoms such as bowel problems, anxiety, and autonomic dysreflexia was associated with increased use of alternative therapies. On the other hand, urinary tract infections and seizures were associated with the use of fewer alternative therapies.

A third published study explored CAM use among 103 outpatients in a rehabilitation medicine practice (19). The authors found that 29.1% of their sample used CAM and that the most common presenting problems were back, shoulder, and neck pain. This percentage is much lower than that observed in the Eisenberg and Krauss surveys. Subjects were still in outpatient rehabilitation, however, which suggests that they were still using conventional medicine and had little inclination to explore alternative modalities at the time. Massage, chiropractic manipulation, vitamin and mineral supplements, and acupuncture were the most frequently used therapies. Fifty-three percent of the users believed that CAM methods were effective to some degree.

All of these surveys provided interesting information about CAM use in a variety of patient populations. However, these surveys did not specifically explore CAM use for pain management among those with SCI. The purpose of the present study was to determine whether individuals with SCI use CAM for the treatment of chronic pain and to explore the patterns of and reasons for CAM use.

## METHODS

### Participants

Individuals with SCI in the northern New Jersey and New York metropolitan area were contacted using an existing database of individuals who responded to advertisements and recruitment letters for a study investigating the efficacy of acupuncture in the treatment of chronic pain and depression following SCI. This acupuncture clinical trial was conducted by the Center for Alternative and Complementary Medicine (the Center) at Kessler Medical Rehabilitation Research and Education Corporation (KMRREC).

This sample was selected because it included an identified group of individuals with post-SCI chronic pain. Of the initial sample of 135, 4 (2.96%) could not be contacted because of nonworking phones, 5 (3.7%) were ineligible because they did

**Table 1.** Demographic Characteristics of the Sample Organized by Complementary and Alternative Medicine (CAM) Use

Characteristic	Use of CAM				Overall Sample (n = 77)	
	Used CAM (n = 43)		Never Used CAM (n = 34)			
	n	%	n	%	n	%
<b>Sex</b>						
Male	25	58.1	22	64.7	47	61.0
Female	18	41.9	12	35.3	30	39.0
<b>Age, y</b>						
18-24	2	4.6	3	8.8	5	6.5
25-34	2	4.6	4	11.8	6	7.8
35-49	26	60.5	13	38.2	39	50.7
≥50	13	30.3	14	41.2	27	35.0
<b>Race</b>						
White	37	86.0	23	67.6	60	78.0
Black	3	7.0	3	8.8	6	7.8
Latino	2	4.7	5	14.7	7	9.0
Asian	1	2.3	2	5.9	3	3.9
Other	0	0.0	1	2.9	1	1.3
<b>Education</b>						
High school or less	10	23.3	12	35.3	22	28.6
College/trade school	21	48.8	18	52.9	39	50.6
Graduate/professional school	11	25.6	4	11.8	15	19.5
<b>Income, \$</b>						
<20,000	7	16.3	12	35.3	19	24.7
20,000-40,000	10	23.3	1	2.9	11	14.3
40,000-60,000	4	9.3	5	14.7	9	11.7
60,000-80,000	7	16.3	2	5.9	9	11.7
>80,000	8	18.5	2	5.9	10	13.0

not speak English, 8 (5.9%) were either hospitalized or deceased, and 41 (30.4%) were unavailable despite at least 4 contacts. The remaining 77 completed the telephone interview, yielding a total response rate of 57%. Demographic characteristics of the entire sample are presented in Table 1. Most respondents were male (n = 47, 61%). The ratio of males to females (2:1) in this sample was lower than the SCI population ratio of 4:1, indicating that disproportionately more women than men participated in our phone survey. This response bias is typical of survey methodology (20). Of this group, 15 respondents had participated in the Center's prior acupuncture analgesia clinical trial. The primary difference between participants in the acupuncture clinical trial and the other survey respondents was the nature of their injury. To be included in the acupuncture clinical trial, participants must have had a traumatic SCI. There were no significant differences in any sociodemographic variables, pain severity, or duration between the 15 respondents who participated in the acupuncture clinical trial and the other 62 respondents.

#### Procedure

Participants completed a 30-minute telephone survey of health care practices for the management of chronic pain. The

Institutional Review Board at KMRREC approved the survey design and procedure. The initial part of the interview involved questions regarding demographic information, the nature and duration of SCI and pain symptoms, use of conventional medicines and therapies (ie, medication or therapies such as physical therapy that were recommended by their physician), and satisfaction with conventional medicine and their physician. Participants were then asked specifically about their use of complementary and alternative health care to manage chronic pain. No definition of CAM was offered other than "any treatment or remedy (other than standard over-the-counter medications) that you are using (or have used) for your pain that was not prescribed or recommended by your physician." CAM use for pain was defined as "any use [of CAM] since the onset of pain symptoms following your SCI." Participants were asked about current and past CAM use, their reasons for using CAM for pain relief, overall out-of-pocket expenditure, insurance coverage, and details about the type of CAM. Participants were also asked about the duration and frequency of CAM use, whether a CAM practitioner was consulted, perceived effectiveness of the CAM for pain relief, and any adverse effects.

**Table 2.** Nature of Spinal Cord Injury Organized by Complementary and Alternative Medicine (CAM) Use

Characteristic	Use of CAM					
	Used CAM (n = 43)		Never Used CAM (n = 34)		Overall Sample (n = 77)	
	n	%	n	%	n	%
<b>Cause of Injury</b>						
Motor vehicle accident	19	44.2	12	35.3	31	40.3
Sports injury	7	16.3	4	11.8	11	14.3
Gunshot/stab wound	2	4.7	2	5.9	4	5.2
Fall	6	14.0	9	26.5	15	19.5
Medical cause	5	11.6	3	8.8	8	10.4
<b>Level of injury</b>						
C1-C4	5	11.6	7	20.6	12	15.6
C5-C7	12	27.9	7	20.6	19	24.7
T1-T10	10	23.3	9	26.5	19	24.7
T11-L2	10	23.3	6	17.6	16	20.8
L3-S3	2	4.7	3	8.8	5	6.5
S4-S5	1	2.3	0	0.0	1	1.30
<b>Complete/incomplete</b>						
Complete injury	15	34.9	11	32.4	26	33.8
Incomplete injury	17	39.5	14	41.2	31	40.3
<b>Mobilization*</b>						
Walk independently	5	11.6	3	9.1	8	10.4
Walk with assistance†	20	46.5	18	52.9	38	49.4
Manual wheelchair	23	53.5	16	47.1	39	50.6
Power chair/scooter	16	37.2	9	26.5	25	32.5
Time since injury, y	11.88 ± 9.74		5.81 ± 5.78		9.13 ± 8.69	
Average pain, Likert score (mean ± SD)	5.22 ± 2.00		4.84 ± 2.19		5.05 ± 2.08	

\*Categories overlap, as subjects did not endorse the use of 1 device exclusively.

†Walk with assistance, walk with aid of a walker, crutches, braces, or cane.

## RESULTS

### Patterns of CAM Use

Respondents were asked a series of questions devised to elicit patterns of CAM use for the management of chronic pain among people with spinal cord injuries. CAM techniques were defined for everyone as treatments that are not generally recommended by their internist or health care provider. Where further clarification was necessary, the following examples of CAM techniques were provided: acupuncture, mind-body techniques, chiropractic, dietary changes, prayer, herbs, vitamins, and yoga.

More than half of the 77 respondents reported having ever used a CAM modality for the treatment of chronic pain following SCI (n = 43, 56%), and 34 respondents (44%) reported never having used a CAM modality. Among those who had ever tried a CAM, 58% (n = 25) had discontinued its use, while the remaining 42% (n = 18) were currently using a CAM technique. Among the 43 respondents who had ever used a CAM modality, 35% (n = 15) were participants in the Center-sponsored acupuncture-analgesia study. Of these, 80% (n = 12) attributed their only experience with alternative medicine to their partici-

pation in that study. Without this group of 12 individuals, who might not have tried acupuncture except for our bringing it to their attention and making it available to them, CAM usage in this sample was 40.3% (n = 31). This is probably the more representative percentage for generalization to the overall population with SCI.

CAM users (past and current) were more likely to have higher household incomes than nonusers ( $\chi^2 = 12.59, P < .05$ ). There were no differences in sex, race, or education. Respondents also differed in the duration of their pain and duration since injury. CAM users, on average, tended to have had their injury ( $F = 9.92, P < .01$ ) and pain ( $F = 3.44, P = .07$ ) for twice as long as the nonusers. There were no differences in CAM usage as a function of pain severity (Table 2).

Among current and past alternative medicine users, 46.5% (n = 20) reported visiting both an alternative medicine provider and a physician for the treatment of their pain, while an additional 28% (n = 12) of the group were seeing only their conventional health care provider and using over-the-counter CAM treatments. A small proportion of users (4.7%, n = 2) reported

**Table 3.** Reasons Given for Using, Not Using, or Terminating the Use of Alternative Healthcare for the Treatment of Pain

Reasons for Currently Using Complementary and Alternative Medicine (CAM) Treatments for Pain (n = 18)	
1. Conventional health care has not been effective for pain relief.	88.9%
2. CAMs take into consideration the interrelatedness of mind, body, and spirit.	66.7%
3. Gives me more control over my health care.	55.6%
4. I am open to trying anything that might work for my pain.	38.9%
5. My physician recommended that I try CAM.	27.8%
Reasons for Not Using CAM Treatments for Pain (n = 34)	
1. Never considered it as a treatment option.	41.2%
2. No access to or information about CAM.	14.7%
3. Unable to afford it.	11.8%
4. Not covered by my insurance company.	8.8%
5. My physician suggested that I not use CAM.	8.8%
6. Do not believe that CAMs work.	8.8%
Reasons for Terminating Past CAM Use (n = 25)	
1. Tried CAM but it was ineffective.	24.0%
2. Unable to afford it.	16.0%
3. Not covered by my insurance company.	12.0%
4. Tried CAM but it was only slightly effective.	12.0%

seeing no health care provider, self-treating their pain with over-the-counter alternative remedies. Thirty-eight percent of users (n = 15) indicated that they got their information about CAM techniques from family and/or friends, while the remainder learned about CAM from the media (22.5%), a support group (17.5%), or their physician (15.0%). Among those who were currently using alternative therapies, the number of different CAM treatments used ranged from 1 to 7, however, the modal number of treatments used for chronic pain was 1 modality (n = 18, 43.9%). Another significant portion had tried 2 treatments for their pain (n = 12, 29.3%), while 6 people (14.6%) had used 3 modalities, and the remaining 5 people had used 4 or more CAMs. The number of CAM treatments tried by respondents was not related to pain severity. The duration of CAM use ranged from 4 months to 18 years (mean, 3.64; SD, 4.28 years), but most people indicated using CAM for either 1 (n = 11, 28.0%) or 2 (n = 5, 12.8%) years.

### Predictors of CAM Use

*Self-Report.* Respondents were first asked to identify their reasons for currently using, never having used, or using CAM in the past and terminating CAM use. These 3 categories were mutually exclusive. Respondents who indicated that they were currently using CAM modalities to treat pain cited the following

reasons: (1) dissatisfaction with the effectiveness of conventional medicine (n = 16, 88.9%), (2) desire to use therapies that recognize the interrelatedness of mind, body, and spirit (n = 12, 55.6%), (3) desire to have more control over their own health care (n = 10, 55.6%), and (4) need to try all medical techniques—alternative or conventional (n = 7, 38.9%). Among respondents who had never used CAM, the most frequently cited reasons for not using CAM were (1) having never thought about or considered the use of CAM (n = 14, 41.2%), (2) no access to alternative health care or information about it (n = 5, 14.7%), and (3) being unable to afford CAM out of pocket (n = 4, 11.8%). Those respondents who used CAM in the past but stopped cited 2 major reasons for doing so: (1) having tried CAM in the past and found it ineffective (n = 6, 24.0%) and (2) being unable to afford CAM out-of-pocket costs (n = 4, 16%). Table 3 summarizes these results.

*Other Predictors.* We next looked at the role of personal characteristics, including injury and pain-related variables, as possible predictors of CAM use. We first explored which variables would predict membership in one of two categories of outcome—use versus nonuse of alternative health care. A series of separate logistic regression models, each controlling for the demographic variables of race, income, age, sex, and education, were tested for several factors related to injury, pain and conventional health care use (Table 4). Independent variables in the logistic analyses included duration of SCI, severity of pain symptoms, level of pain-related impairment, use of conventional pain medications, side effects from conventional medications, satisfaction with conventional pain treatment, and satisfaction with a conventional physician. Discrete variables were coded as 0-1 for no-yes or absence-presence of a characteristic. Contrary to other surveys (15), with the exception of annual family income, there were no significant differences between users and nonusers for any of the other demographic variables mentioned. In terms of annual household income, the only real difference was between individuals with very low incomes (<\$20,000) and those with incomes of \$20,000 or more. CAM use was significantly more common among people with annual incomes  $\geq$ \$20,000 (81%) compared with those who had lower incomes (19%,  $P < 0.01$ ). As shown in Table 4, the duration of SCI and the use of conventional pain medications were the only 2 significant predictors of CAM use. For every 10-year increase in the duration post-SCI, there was approximately a 3-fold increase in the likelihood that respondents would use CAM for pain relief. Those who did not use any conventional pain medications were approximately 6.5 times more likely to be using CAM.

We next considered which personal characteristics and beliefs predicted the extent of CAM use (ie, number of CAM modalities tried) among CAM users. Predictors included in the model were use of conventional pain medications, side effects of conventional medicine, limitations on functioning, desire to have control over one's health care, satisfaction with conventional treatment and physician, and severity of pain symptoms. A series of separate linear regression models were tested for each of these independent variables controlling for age, sex, race, education, and income (Table 5). Only one variable was significantly associated with the number of therapies or modalities used by

**Table 4.** Logistic Regression Predicting Complementary and Alternative Medicine (CAM) Use From Injury, Pain, and Conventional Medicine Use Factors, Controlling for Demographic Variables (Age, Sex, Race, Income, and Education)\*

Variable	Parameter Estimate	SE	Wald $\chi^2$	Significance	Odds Ratio	95% CI
Duration of SCI	1.18	0.50	5.48	0.02	3.26	1.21, 8.75
Duration of pain	0.63	0.48	1.73	0.19	1.87	0.74, 4.75
Pain severity	0.16	0.15	1.21	0.27	1.17	0.88, 1.56
Pain interference	-0.02	0.11	0.03	0.86	0.98	0.79, 1.22
Medication use	1.87	0.91	4.21	0.04	6.46	1.09, 38.37
Satisfaction with physician	0.64	0.45	2.04	0.15	1.89	0.79, 4.52
Satisfaction with pain medication	0.13	0.39	0.11	0.17	1.14	0.53, 2.42

\*CI indicates confidence interval; SCI, spinal cord injury.

CAM users: the use of conventional pain medications ( $R^2 = 0.50$ ;  $\beta = 0.67$ ,  $P < 0.01$ ). Individuals who used any conventional pain medications, regardless of the type of pain medication being used (opiates, nonsteroidal anti-inflammatory drugs, over-the-counter, etc), tended to use fewer alternative therapies. Use or nonuse of pain medications was not related to severity of pain or the impact of pain on functioning. There were nonsignificant trends suggesting that 2 other variables predicted the amount of CAM use: the desire to be in control of one's health care ( $R^2 = 0.08$ ;  $\beta = 0.38$ ,  $P < 0.10$ ) and dissatisfaction with one's doctor or health care provider ( $R^2 = 0.13$ ;  $\beta = -2.05$ ,  $P < 0.06$ ). The more dissatisfied people were with their doctor, the more likely they were to use CAM therapies. Likewise, people who wanted more control over their health care decisions were more likely to try more alternative therapies.

#### Types and Efficacy of CAMs Used

Even when excluding those respondents whose only experience with CAM was their acupuncture treatments as part of the Center's acupuncture analgesia study, the most frequently used CAM modality (including past and current users) was acupuncture ( $n = 15/31$ , 48.4%). Massage ( $n = 8/31$ , 25.8%), chiropractic manipulation ( $n = 7/31$ , 22.6%), and herbs ( $n = 6/31$ , 19.4%) followed, but were not endorsed as frequently as acupuncture was. It was hypothesized that choice of CAM techniques might be

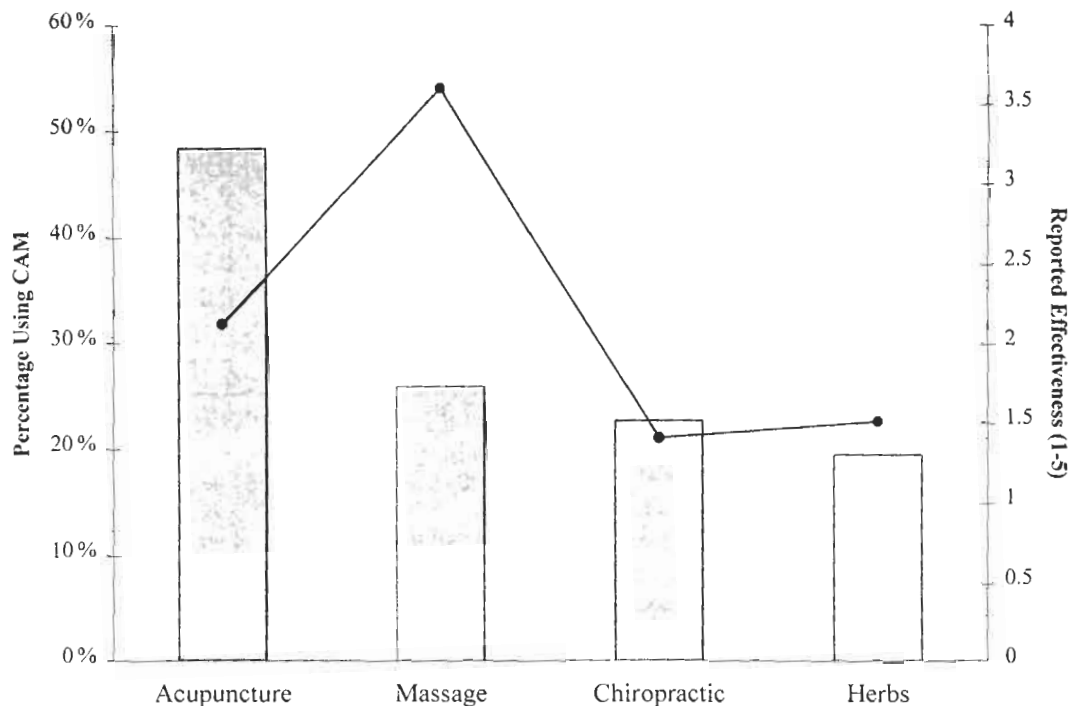
related to effectiveness, where more effective techniques would be endorsed with greater frequency. Respondents were asked to indicate on a scale from 0 to 5 (5 being most effective) how effective their CAM techniques were at relieving pain. Acupuncture received a mean rating of only 2.12 (SD, 1.75) despite its high rate of use in this sample. Number of years since injury was not related to perceived efficacy of acupuncture. As would be expected, those respondents who used acupuncture in the past but stopped tended to rate acupuncture as less efficacious than those who were currently using the modality,  $t_{11} = 2.05$ ,  $P = .06$ . Interestingly, massage, which was used by considerably fewer respondents than acupuncture, was rated as much more effective (mean, 3.6; SD, 1.79). Chiropractic therapy and herbal remedies were not considered very effective for pain relief (chiropractic, mean, 1.40, and SD, 1.95; herbs, mean, 1.5, and SD, 1.0). Figure 1 displays these results.

In an effort to determine whether there were subject characteristics in this sample that were associated with selection of acupuncture for pain relief (in light of other therapies that appear to be more effective), acupuncture users were compared to nonusers on measures of pain severity and interference in daily living, as rated on 10-point Likert scales. The results indicate that acupuncture users did not differ from nonusers on pain severity,  $t_{75} = 0.046$ ,  $P = 0.96$ . However, acupuncture users did indicate that their pain interfered with their day-to-day functioning

**Table 5.** Linear Regression Predicting Amount of Complementary and Alternative Medicine (CAM) Use (ie, Number of CAM Modalities) Controlling for Demographic Variables (Age, Sex, Race, Income, and Education)

Predictor	Adjusted $R^2$	B	SE	$\beta$
Medication use	0.50	-2.95	0.58	-0.67*
Side effects of conventional medications	0.01	-0.39	0.58	-0.13
Pain severity	0.00	0.00	0.11	0.06
Pain interference	0.01	0.00	0.09	-0.12
Satisfaction with physician	0.08	0.49	0.28	0.38†
Satisfaction with pain medication	0.01	0.23	0.32	0.16
Need for control over health care decisions	0.13	-1.13	-0.40	-2.05†

\* $P < .01$ ; † $P < .10$ .



**Figure 1.** Percentage of users ( $n = 31$ ) using specific complementary and alternative medicine (CAM) methods and their reported effectiveness on a scale of 1 to 5. The bar represents the percentage of users and the line represents reported effectiveness of each CAM modality.

significantly less than those respondents not using acupuncture,  $t_{75} = 2.43$ ,  $P < 0.05$ . As a comparison, the same analyses were run for users and nonusers of massage (ie, the second most frequently used modality). The results indicate that massage users and nonusers were no different in average pain severity,  $t_{75} = 1.07$ ,  $P = .29$ , nor did they feel their pain interfered any less with daily functioning,  $t_{75} = 1.67$ ,  $P = .09$ .

#### Payment for CAM

Respondents were asked questions regarding insurance reimbursement for CAM modalities. These questions are particularly important considering that the third most frequent reason cited for not using CAM was inability to afford CAM use. Only 35.5% of CAM users ( $n = 11$ ) indicated that insurance covered any of their CAM techniques. Among those 11 respondents, chiropractic manipulation and acupuncture were listed as the only treatments covered by their insurance companies. Of the few respondents who had insurance coverage for CAM use, half ( $n = 5$ , 45.5%) indicated that they were very satisfied with their coverage. The more satisfied respondents were with their insurance coverage for CAM, the more alternative treatments they were likely to use,  $r_{11} = .763$ ,  $P < .05$ .

#### DISCUSSION

We found that more than half (56%) of those with chronic pain following SCI had at some time used or were currently using alternative health care for pain relief. However, a number of these individuals had their first and only experience with CAM through the KMRREC analgesia study. If we assume that most of these

individuals would otherwise not have used CAM, ie, considering them to be nonusers for this purpose, then the percentage of CAM users in the sample (40.3%) looks quite similar to the percentage of general population reported by Eisenberg et al. (16), though still somewhat higher than that found in other patient populations with chronic medical conditions, such as patients with brain tumors (24%) (21) and rehabilitation medicine outpatients (29.1%) (21). On the other hand, the adjusted frequency of use found in this study was lower than the 57% found in the survey by Krauss et al of individuals with chronic physical disabilities, including pain (17), and the 66% found in individuals with arthritis, in whom severity of chronic pain was significantly associated with frequency of use (22). Although both the Krauss and Wainapel surveys included fairly heterogeneous rehabilitation samples, they differed in that the latter included patients actively seeking treatment at an outpatient clinic offering conventional health care. Therefore, they may have been less inclined to use alternative health care, which may account for the large difference in frequency of CAM use between the 2 studies. In any case, our sample appears to be squarely in the middle of the range of frequencies of CAM use reported in the past few years.

We found that those who had tried CAM tended to be better off financially, to have had their injury for longer periods of time, and to be more involved in making their own health care decisions. CAM users were also less likely to be using conventional medications for their pain, possibly because they had already tried it without effect or its use was inconsistent with their beliefs about holistic health care. Those who had tried CAM and discontinued its use usually reported they did so because it



did not work for them. Those who had never tried CAM either could not afford it, did not appear to be aware of or interested in trying new approaches beyond what their doctor had recommended, or did not have access to alternative health care.

The most commonly used alternative by far was acupuncture. However, despite its popularity in this sample, acupuncture was rated as relatively ineffective in managing pain. Possible reasons for the popularity of a technique with a low effectiveness rating include its general availability and growing acceptance in conventional health care settings; its general reputation for effectiveness in treating pain; its endorsement by the National Institutes of Health Consensus Development Conference (23), and its selective efficacy for certain types of pain. Results from our clinical trial on acupuncture in pain management with SCI (S.N., S.C.S., S.A., N.E. Schoenberger, S. Kirshblum, A. Averill, and A.C. Cotter, unpublished data) suggest that, although quite effective for many subjects (approximately 45%), acupuncture was not at all effective for a substantial subset of SCI subjects that included a large proportion of those with neuropathic pain. Interestingly, the NIH Consensus Development Conference on Acupuncture (23) concluded that the evidence for pain management was compelling only in limited situations.

The second most popular alternative technique for treatment of pain was massage therapy, although it was used substantially less frequently than acupuncture. Despite its lower frequency of use, it was given the highest success rating for managing pain, which suggests that its potential usefulness is not well known in the SCI population or that lack of coverage by insurance limits its use among most individuals with SCI. Another possible explanation for these findings may be the role of placebo effects or the nonspecific effects of the treatment itself. However, evaluating the specific parameters (such as length of treatments, location of application, mode of application) of the treatments obtained by participants was beyond the scope of the study. These questions will need to be addressed in a placebo-controlled clinical trial designed to look at treatment efficacy. Other CAM therapies (chiropractic manipulation and herbal medicine), chosen at relatively low frequencies, all had low success ratings, similar in degree to acupuncture.

Given that this is a convenience sample, it is limited in its representation of the post-SCI population with chronic pain and, hence, may contain some degree of selection bias. Because we surveyed a group that was responding to an advertisement for an acupuncture clinical trial, CAM use may be overrepresented in this sample. In addition, because interviews were conducted in English, non-English speakers are probably not adequately represented. Another limitation of these data is that it was entirely self-reported. Findings pertaining to the efficacy of CAM treatments need to be confirmed in future follow-up studies that involve the use of objective outcome measures. This study is a first step in that direction, and was designed to explore the phenomena that drive people with SCI to use CAM therapies.

## CONCLUSIONS

Despite the small opportunistic sample used in this survey, it appears that the use of alternative health care is similar in this

population to that of the general population. Our results suggest that individuals with chronic pain following SCI often use CAM but have varying experiences of success, from very satisfactory to no help at all. Higher incomes and longer duration of pain differentiated those who used CAM versus those who did not. The number of CAM methods used was related to nonuse of conventional prescription and over-the-counter pain medications and the desire to control one's health care decisions. The most popular therapy, acupuncture, was reported to be of only limited effectiveness, whereas massage therapy had an unexpectedly low frequency of use, given that it was reportedly the most effective CAM therapy of all. Further research is needed to confirm the reported success of massage in controlling pain.

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