PSYCHOSOCIAL PREDICTORS OF HEALTH CARE UTILIZATION

IN PATIENTS WITH CHRONIC PAIN IN

RURAL ALABAMA

by

SHWETA KAPOOR

BEVERLY E. THORN, COMMITTEE CHAIR

REBECCA S. ALLEN

GARY R. KILGO

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ABSTRACT

This study examines psychosocial factors affecting health care utilization (HCU) in patients residing in rural AL who participated in psychosocial treatment for chronic pain. Based on previous literature, it was hypothesized that depression, disability, education, and quality of life would predict health care utilization both pre- and post-treatment. Additional exploratory aims included investigating whether completion status predicted health care utilization post-treatment and if the self-reported psychosocial measures predicted completion status. HCU data were gathered from medical records at two AL rural health centers and included number of visits, interval between visits, prescription analgesics, and comorbidities. Participants also completed the Pain Catastrophizing Scale, Roland Morris Disability Scale, Quality of Life Scale and Center for Epidemiologic Studies Depression Scale before as well as after treatment. Medical records for 64 participants were available for review. The participants were predominantly African-American (67.2%) females (73.4%) with an average age of 49.34 years and mean duration of pain of 18.5 years. Multiple regression analyses revealed that depression and pain catastrophizing predicted number of visits pre-treatment with depression accounting for most of the variance while catastrophizing and quality of life contributed to the model predicting the average interval between visits pre-treatment. Perceived disability and catastrophizing contributed to the regression model for HCU post-treatment. In regard to treatment completion, the latter was uniquely and significantly predicted by education, depression, quality of life, and catastrophizing. Thus, although rural patients in this study shared several common predictors of HCU with urban patients, catastrophizing emerged as an important predictor of both health care services use and treatment completion in this study, seldom reported in previous studies.

DEDICATION

I dedicate this thesis to my husband, Nitin and son, Veer. You both are the meaning and happiness in my life. I dedicate it to my loving parents, though no words or dedications are enough to truly reflect how much you mean to me. Thank you! And my kid brother; you are my joy and my pride.

LIST OF ABBREVIATIONS AND SYMBOLS

HCU: Health care utilization

C: Completers

NC: Non-completers

Pre-Rx: Pre-treatment

Post-Rx: Post-treatment

CES-D: Center for Epidemiological Studies-Depression Scale

PCS: Pain Catastrophzing Scale

QLS: Quality of Life Scale

RMDS: Roland-Morris Disability Scale

F: Fisher's F ratio: A ration of two variances

p: the probability of obtaining a test statistic at least as extreme as the one that was actually observed, assuming that the null hypothesis is true

r: Pearson product-moment correlation

SD: The average distance of the scores from the mean of the probability distribution

SE: The standard deviation of the sample mean estimate of a population mean

CI: Confidence interval

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INTRODUCTION

Chronic pain is a major public health problem.[4] According to a recent report by the Institute of Medicine, pain costs approximately 635 million dollars annually and affects an estimated 116 million American adults.[6] This surpasses the number of people suffering from chronic disorders, including cardiovascular disease, cancer, and diabetes taken together.[6] Patients with chronic pain utilize health care services much more than non-pain patients.[5, 54] Increased health care utilization and lost productivity accounts for most of this huge expenditure.[6] A majority of the patients with chronic pain visit multiple providers and undergo surgical procedures in search of some alleviation of their pain.[44] They have a higher number of hospital admissions, longer durations of hospital stays, and often make trips to the emergency department without getting adequate relief. This rather inefficient treatment for pain is contributing to the swift rise in health services costs in the United States.[44]

In this context, studying patterns of health care use in patients with chronic pain is of great importance. There is evidence that psychosocial factors like psychological distress, depression, quality of life, educational attainment, and disability predict health care utilization in patients with chronic pain.[5, 16, 32, 54] However, most of these studies have been conducted in large urban multispecialty hospitals. There is a need for studies that specifically examine health care utilization patterns and predictors in rural chronic pain patients. People living in rural areas have reported experiencing higher pain frequency and intensity than people with pain living in urban areas.[19, 33] Unique problems are associated with health care access in rural areas and health care disparities between rural and urban areas are widely recognized.[33,29] Usual predictors of health

care utilization like income and education may not play a big role in rural populations due to the low socioeconomic status and literacy generally associated with rural residency and rural patients.[2,29] Thus studies conducted in large, multidisciplinary urban health centers may not closely reflect the factors affecting health care utilization in a primarily rural pain population.[49]

Since the past few decades, pain management has moved from a biomedical to a biopsychosocial model, especially in multidisciplinary pain treatment centers.[14, 50, 51] Psychosocial treatments are increasingly being employed in rural areas.[12, 45] Research has established the efficacy of different types of psychosocial treatments.[50, 51,18,46, 47] These treatment studies have evaluated changes in a number of outcome measures. The most commonly assessed self-reported outcome measures in chronic pain clinical trials are physical functioning, pain-related disability, psychological and emotional functioning, and patient's satisfaction with the treatment.[14, 18] Changes in patterns of health care utilization as an outcome measure in clinical trials for chronic pain have not received much attention.[27] Examining changes in health care use patterns after participation in a psychosocial treatment for chronic pain can provide a vital measure of the treatment's efficacy. Morley, et al., (1999) in their meta-analyses, reported that very few studies (~12%) have examined health services use as an outcome measure in randomized control trials of cognitive behavioral treatment for chronic pain.[27] Caudill et al., (1991) looked at health care utilization as an outcome measure and reported that health care utilization in chronic pain patients decreased after participation in a behavioral medicine treatment program.[8] However, similar to the majority of studies in this area, the mentioned study was carried out in an urban setting.

It is also important to note here that the majority of the studies that focused on health services use obtained utilization data through self reports. One of the limitations of using a self

report method is recall bias of the participants. Previous research has shown that people tend to underreport their number of physician contacts.[31] Keeping this in mind, utilization data obtained directly from medical records would prove to be a more objective and accurate source of information. The present study was focused specifically on pain patients residing in rural Alabama with low socioeconomic status and low literacy who participated in one of the two psychosocial treatment programs for chronic pain.[45]

There were three main aims: the first was to investigate psychosocial factors that affect health care utilization in this specific group of patients; the second was to explore if completion status was a predictor of health care utilization post-treatment; and the final aim was to investigate whether the self-reported psychosocial measures predicted completion status. It was hypothesized, based on previous literature, that health care utilization would be influenced by demographic factors like sex, age, income, and education as well as by psychosocial measures, including, psychological distress, disability, pain duration, and pain intensity. It was also hypothesized that completion status would be predictive of the patterns of health care utilization post-treatment and that the self-reported psychosocial factors completed pre-treatment would predict whether the participants completed the treatment or not.

METHOD

Participants

This study was approved by the University of Alabama Institutional Review Board. Participants were a sub-set of participants recruited for a larger randomized control trial comparing cognitive behavioral therapy to an education intervention for chronic pain. The results from the larger study indicated that both treatments were efficacious and feasible.[45] The participants were administered a pre-treatment interview during which they completed the demographic and psychosocial measures included in this study. Only those participants who were 19 years or older, diagnosed with at least one form of chronic pain due to a non-malignant cause by their physician and reported having pain most days of the month in the previous 3 months were included in the study. The study excluded participants who had HIV-related or cancer pain[24], noteworthy cognitive impairment, screened by the Mini-cog[34,7] or history of any disorders that might warrant emergency psychiatric care like schizophrenia, seizure disorder, or substance abuse during the treatment sessions. From this larger sample, the participants whose medical records were accessible for review at the rural health centers where the groups were conducted were included in the present study. Some records were unavailable as those participants were not regular patients at these two health care centers.

For the purpose of analyzing the factors affecting completion of the treatment programs, the participants were divided into two groups, namely, completers and non-completers. Completers included patients who completed the treatment program whereas non-completers

were the participants who either started the treatment group but dropped out in between or the ones who completed the pre-treatment interview but did not start the treatment program.

Measures

Sociodemographic measures, psychosocial measures, and medical records were collected as part of the larger study mentioned above. The measures include a socio-demographic questionnaire, Leeds Assessment of Neuropathic Signs and Symptoms (LANSS)[3], Pain Catastrophizing Scale (PCS)[42], Center for Epidemiological Studies Depression Scale (CES-D)[30], Brief Pain Inventory (BPI), Quality of Life Scale (QLS)[9] and Roland-Morris Disability Index (RMDS)[40].

The demographic questionnaire, developed for this study, was used to collect information about age, ethnicity, sex, disability status, education, relationship status, and annual income. In additional, accessibility to the health care center was calculated in terms of the total distance travelled to the health care center.

The participants completed two sets of psychosocial measures; one set was completed prior to the start of the treatment program and the second at the completion of treatment. The set of measures completed pre-treatment were used as predictors for health care use 3 months pre-treatment while the measures completed post-treatment were used to predict health care use 12 months post-treatment.

Leeds Assessment of Neuropathic Signs and Symptoms questionnaire (S-LANSS): A self-report version of the LANSS questionnaire was used. This questionnaire helps distinguish neuropathic from non-neuropathic pain and also determines if any of the participants have malignant sources of pain without the need of a clinical examination.[3] For the present study,

information regarding the participants' primary pain location, duration of pain and the different types of treatments sought for the pain was analyzed.

Catastrophizing: Pain Catastrophizing Scale (PCS) was used to measure pain catastrophizing.[42] The PCS is a 13-item measure asking respondents to rate the extent to which they have particular thoughts and emotions when they experience pain. The PCS measures catastrophizing on three dimensions, namely, magnification, rumination and helplessness and the total score for catastrophizing is the sum of the raw scores. Higher scores indicate greater catastrophic thinking.

Depression: The Center for Epidemiological Studies Depression Scale (CES-D) was used to assess depression.[30] It is a 20-item questionnaire where the respondents rate the frequency with which each item occurred over the previous week. Higher scores indicate greater depression. The CES-D has high internal consistency, adequate test-retest reliability, and convergent as well as discriminant validity.[30] The CES-D has been validated for use in chronic pain patients.[52]

Pain intensity and interference: Using the Wisconsin Brief Pain Inventory, participants rated their most severe pain, least severe pain, and average pain over the past week as well as their current pain levels on a 10-point Likert scale.[11] Participants also rated interference due to pain in their daily activities, mood, and sleep. The BPI has demonstrated good internal consistency ($\alpha = .85$) in a variety of pain populations including malignant and non-malignant pain in different parts of the world.[22, 43]

Perceived disability: The Roland-Morris Disability Scale, an 11-item scale (RMDS) was used to appraise perceived disability due to pain.[40] Participants chose items that applied to them

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over the past month, and a total score was obtained by summing the number of items selected (total scores range from 0 to11). The RMDS is the most widely used scale to assess the level of disability when starting a new treatment program, assess treatment outcomes in pain management programs in terms of reduction in perceived disability, and to assess disability due to pain in disability claims.[40]

Quality of life: The Quality of Life Scale (QLS) is a 7-item scale and was used to assess the degree of participant satisfaction with various areas of their life.[9] The QLS utilizes a 7-point Likert scale and total scores range from 7 to 49; lower scores indicate lower quality of life. This scale has been shown to correlate moderately with distress, and weakly with measures of functioning and pain intensity, indicating the QLS is measuring a unique construct different than pain or disability. A psychometric analysis of the QLS showed it to be internally consistent, reliable across time, and representative of a single construct.[9]

The medical records data included all the visits to health center. The total number of visits in a period of 3 months before and 12 months after the treatment, the average interval between visits in the same time periods, the prescription analgesics, pain diagnoses, and any comorbidities were recorded.

Procedure

Patients with chronic pain were recruited for participation in one of the two psychosocial treatment programs being offered for chronic pain from four health centers in four different rural counties in Alabama. For the purpose of this study, data were only included from the health centers in Walker and Wilcox counties (our primary treatment sites). The two psychosocial treatments were cognitive behavioral treatment and an educational intervention. After an initial

screening of potential participants over the phone, demographic and psychosocial measures were collected as part of a pre-treatment interview. The medical records review was performed on-site at Pine Apple Rural Health Center (Wilcox County) and Capstone Rural Health Center, Parrish (Walker County). The physician and the pharmacist notes were read through and health care utilization data recorded. Although the participants received compensation in terms of travel expenses for attending the treatment sessions and additional compensation for the pre- and post-treatment interviews, they received no extra compensation for this medical records review. Informed consent for access to their medical records from 3 months pre-treatment to 12 months post-treatment as a part of this treatment program was obtained at the beginning of the program.

Statistical Analyses

The data were analyzed using IBM SPSS Statistics v.19.0. Descriptive analyses of sociodemographic, pain characteristics, psychosocial measures, and health care utilization are reported using frequency statistics and cross tabulations in Tables 1, 2, and 3.

In the first part of the analyses, regression models were run with income, sex, depression, pain catastrophizing, quality of life and self-reported disability as predictors of the number of visits 3 months prior to treatment and the average intervals between visits as most of these factors have been previously related to healthcare utilization.[15, 54, 48] In the second phase of data analysis, completion status was tested as a predictor for health care utilization post-treatment. Completion status included two groups of participants, those who completed the treatment program and those who either started the program but dropped out before completing all ten sessions or who participated in the pre-treatment interviews but did not attend any of the ten weekly treatment sessions. In the third phase, the psychosocial measures were tested as

predictors of treatment completion. Depression, catastrophizing, quality of life and perceived disability due to pain were entered as predictors. Given the sample size, instead of entering all the variables of interest into the regression model, univariate analyses were conducted for each regression analysis to identify independent variables of interest that correlated significantly with the dependent variables; only those variables obtaining significant univariate findings were added as predictors.

The independent variables included in the preliminary analyses were age, sex, pain duration, years of education, disability-seeking status, depression, catastrophizing, quality of life, and perceived disability. The dependent variables were the number of visits pre-treatment, number of visits post-treatment, average interval between visits pre-treatment, average interval between visits post-treatment, health care utilization post-treatment, and treatment completion. For each of the regression models, preliminary analyses were conducted to confirm that there was no violation of linearity, multicollinearity and homoscedasticity.

RESULTS

Medical records of 64 participants out of a total of 106 participants were available for review (60.4%). They were predominantly African-American (67.2%), females (73.4%) with an average age of 49.34 (*SD=12.48*) years. These included 37 completers and 27 non-completers. Table 1, 2, and 3 detail the demographic, pain, and clinical characteristics of the sample, respectively. Tables 4 and 5 detail the results of the multiple linear and logistic regressions, respectively.

Predictors of health care utilization

Multiple regression analyses were performed to investigate the predictors of health care utilization in the overall sample of rural chronic pain patients 3 months prior to the beginning of the pain treatment program. Univariate correlation analyses with age, sex, annual household income, number of pain locations, duration of pain, perceived disability, depression, catastrophizing, and quality of life revealed that depression, quality of life, and catastrophizing significantly correlated with the number of visits pre-treatment. Higher self-reported depression, catastrophizing, and lower quality of life were correlated with greater number of visits. However, quality of life had to be removed from the regression model due to problems of multicollinearity with depression. Consequently, depression and catastrophizing were added as predictors and the results indicated that the model explained 13.3% of the variance in the number of visits 3 months before treatment [R^2=0.133, $F(3,59)$=4.677, $p<0.05$). Depression made a significantly unique contribution to the model (β=.362, p=.014), accounting for 36.2% of the variance in the pre-treatment visits.

Catastrophizing and quality of life correlated significantly with the average interval between visits pre-treatment. The regression model with these two predictor variables significantly explained the variance in the average interval between visits pre-treatment [R^2=.211, $F(2,33)$=4.138, p=.026]. Catastrophizing made the most contribution to the variance of the dependent variable (β=-.315, p=0.079) that trended towards significance. Higher catastrophizing and lower quality of life correlated with longer intervals between visits pre-treatment.

Univariate analysis indicated that perceived disability due to pain and catastrophizing (both completed post-treatment for this analysis) had a significant correlation with the number of visits post-treatment. Multiple regression analyses revealed that the model explained 17.7% of the variance in the number of visits 12 months after treatment [R^2=0.177, $F(2,34)$=3.45, p=0.044). Perceived disability contributed most to the model (β=0.362).

Univariate analyses revealed that only catastrophizing and perceived disability had significant correlations with the average interval 12 months post-treatment. The regression model including these two variables explained 24.9% of variance in the average interval between visits post-treatment [R^2=0.249, $F(2,25)$=3.80, p=0.037] and the model explained 24.9% of the variance of the average interval. Catastrophizing accounted for 33.9% of the variance while perceived disability due to pain accounted for 25.9% of the variance in the model. Higher catastrophizing and more perceived disability due to pain were associated with shorter intervals between visits.

Multiple regression analyses revealed that completion status did not predict either of the post treatment health care services utilization measures.

Univariate analyses revealed that demographic variable of education was significantly correlated with treatment completion. Logistic regression was conducted to examine the impact of education, depression, catastrophizing, quality of life, and perceived disability on the likelihood of a participant completing a psychosocial treatment program for chronic pain. The full model was statistically significant, $\mathcal{K}^2$(5, N=61)=20.225, $p<.001$, indicating that the model could differentiate between between participants who completed the treatment and those who did not. The model as a whole explained between 28.2% (Cox and Snell R square) and 37.9% (Nagelkerke R squared) of the variance in completion status, and correctly classified 77% of cases. Except perceived disability, all the other four variables made a unique and significant contribution to the model. Education, followed by depression, was the strongest predictor of completion status, with participants having higher education level or higher depression being more likely to complete the treatment.

DISCUSSION

This study aimed to investigate the association between psychosocial factors and patterns of health care utilization in a cohort of people residing in rural Alabama suffering from chronic pain. It is known that chronic pain patients, as compared to other illness groups, utilize more health care services, affecting not only the individuals with pain and their families but the overall health care system.[5, 28] People residing in rural areas have unique cultural, social, and economic factors that affect their care-seeking and illness behavior.[19,49] There are limited resources, putting enormous burden on the existing resources.[33] Socioeconomic disparities between urban and rural populations put the rural populations at a disadvantage and thus, generalization of results of urban studies to rural populations may not be appropriate.[36]

As hypothesized, psychosocial factors affected health care utilization in this rural sample of patients with chronic pain. Our results indicated that, over all, depression, catastrophizing, perceived disability, and quality of life each contributed to one or more of the health care utilization measures. These findings replicate previous studies where psychosocial measures like self-reported depression, perceived disability, and quality of life influenced health care utilization in patients with chronic illness as well as chronic pain.[15, 54,41] The number of visits in a three-month period prior to the start of treatment was influenced primarily by depression, the latter accounting for most of the variance. Catastrophizing emerged as a very important psychosocial predictor of HCU in this sample. It contributed to the regression model for each of the health care utilization and accounted for the maximum variance in the average interval between visits both pre- and post treatment. To the authors' knowledge, only one other study has

reported catastrophizing as a predictor of health care use.[38] This finding is important as catastrophizing is a robust predictor of pain-related outcomes across a variety of pain patients and clinical settings.[13, 25, 37, 53, 56] It would thus be logical to expect catastrophizing to affect the patterns of health care use in patients with chronic pain. Further, although perceived disability did not predict the number of physician visits in the 3 month period before the start of treatment, it contributed to the regression model that significantly predicted health care utilization post treatment in participants who completed the treatment program, thus, confirming the underlying importance of this variable.

A rather unique measure of health care utilization included in the study was the average interval between visits. This has not been commonly studied as a health care use measure. In conjunction with the overall number of visits made in a specified time period, the interval between these visits enhanced the findings from this utilization data. Taken together, they both provide valuable information about the factors that predominantly influenced the pain patient's need to visit the physician frequently. Our findings indicate that higher catastrophizing and perceived disability due to pain were associated with shorter interval between visits. This is expected as people who perceive themselves more disabled due to their pain, and those who worry and catastrophize more, would probably tend to visit their doctor more often and at shorter intervals.[38]

Previous studies examining the influence of demographic characteristics on health care utilization have not found any significant association between use and age or sex in patients with chronic pain, especially back pain and headache.[1, 20] Our results repeat these findings as demographics of these rural pain patients were not associated with their health care use. This is not surprising, too, given the fact that there was a lack of variability in our sample, which

consisted primarily of females in the low income group. Thus, there was probably not adequate power to detect any differences. A commonly studied aspect of the health care use that was not included in our study is health care insurance.[26, 55] This was due to the fact that the health care centers from where the participants were recruited were federally-qualified, catering to low income families and charging only a minimal fee for the visits and for the medications available at the clinics. Thus, the patients included in our study did not require insurance to receive services, nor did they have it.

Another important finding of this study suggests that education, depression, and catastrophizing contributed significantly to the prediction of completion of treatment. The results indicate that people with higher education attainment were more likely to complete treatment. This replicates previous research with chronic pain patients, patients with other disorders and psychotherapy in general.[17, 35, 39] Although this is not a modifiable factor as we cannot change a person's education, making adaptations to bring the material of the treatment program like cognitive behavioral therapy and educational intervention to a level that can be easily understood by patients with low literacy can specifically target and potentially help these patients to complete treatment.[23] A surprising finding was that patients with more depression and lower catastrophizing were more likely to finish treatment. Previous literature on health care utilization has suggested that more depressive symptoms a patient is experiences, the less likely is he or she is to complete treatment.[21] Our finding is somewhat unique in this rural chronic pain population. Day et al., (2011) in a qualitative study with the same sample, indicated that group processes including sharing one's pain experience and listening to other group members' pain experiences had a large positive impact on the participants.[12] This aspect of the treatment process might have

proved to be especially therapeutic to the more depressed participants, motivating them to keep coming back and successfully complete the treatment program.

The logistic regression model also shed light on the contribution of catastrophizing on the completion of treatment. Participants with higher catastrophizing were more likely to not finish treatment. Catastrophizing has been extensively studied as a robust predictor of negative pain-related outcomes. Findings from the present study indicate that catastrophizing impacts treatment completion, too, and thus should be included as an important variable in the health services use pattern of patients with chronic pain. Thus, examining and incorporating these psychosocial factors that affect completion of treatment can help us reach out to and keep those who may need the treatment more than the less distressed. Such information about the impact of these factors might also prove to be vital for policy makers and health services administrators.

One of the main strengths of our study was the health care utilization data. Most previous studies used self-reported measures by asking participants about the number of visits to health care centers and assessing self-reported analgesic prescriptions. The accuracy of this type of data may be affected by recall bias as it has been reported that under-reporting increases as the interval of health care use in question becomes longer.[31,10] In the present study, health care utilization data were directly obtained from physician and pharmacist notes, providing a more objective and reliable measure of services use.

There were some limitations of this study. The visits were cumulative of all the visits made to the primary care center and not specifically pain related visits due to limited information available about each individual visit. The sample size was small as the availability of the medical records at the health centers was limited. These records were mostly hand-written and only a few

were electronic medical records. Also, the health care utilization data included only the visits to that particular center. Medical records of any emergency visits or specialist visits were not available. However, given the limited access to health care system in this rural population, specialist visits and emergency room visits were likely less frequent than in higher SES clientele or urban treatment settings. For a majority of the participants, their primary care center may have been the only source of health care. Thus, our sample was different from the more-studied urban patients who have access to different kinds of specialists and nearby Emergency Departments. These points notwithstanding, in the future, it would be worthwhile to formally assess other types of health care visits including emergency visits and visits to specialists in rural pain patients to see how much these outlets meet the health services needs of this underserved population. This would provide a more comprehensive picture of the factors affecting health care use in this population.

A larger sample size would also provide more power to examine additional demographic and psychosocial variables affecting health care use. Nonetheless, the present study provides one of the first to focus on a low SES, rural sample of patients with chronic pain, and offers objective, rather than self-report data, of health care utilization and the factors that predict HCU in this population. As such, the study provides a rare examination of a unique and understudied population with gross disparities in treatment access and health outcomes.

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Table 1 Demographics

Variable	Total sample (Mean/Frequency)	Completers	Non-completers
Sex			
Male	17 (26.6%)	10 (27%)	7 (25.9%)
Female	47 (73.4%)	27 (73%)	20 (74.1%)
Age	49.34 (12.48)	51.2 (11.75)	46.82 (13.23)
Race			
White	20 (31.3%)	10 (27%)	10(37%)
African American	43 (67.2%)	26 (70.3%)	17 (73%)
Others	1 (1.6%)	1 (1.7%)	0%
Disability			
Not seeking	45 (70.3%)	26 (70%)	19 (70%)
Seeking	19 (29.7%)	11 (30%)	8 (30%)
Household income			
$0 to $12,999	49 (76.6%)	26 (70.3%)	23 (85.2%)
$13,000 to $24,999	8 (12.5%)	5 (13.5%)	3 (11.1%)
$25,000 to $49,000	7 (10.9%)	6 (16.2%)	1 (3.7%)
$50,000 and above	0	0	0
Education	12.23 (2.57)	12.9 (2.07)*	11.3 (2.92)*

*$p<0.05$

Table 2 Pain characteristics

	Total sample	Completers	Non-completers
Total duration of pain	18.54 (16.28)	20.2 (16.82)	16.25 (15.53)
Number of pain sources	5.18 (2.57)	5.2 (2.88)	5.12 (2.1)
Over-the-counter			
Yes	54 (84.4%)	32 (86.5%)	22 (81.5%)
No	10 (15.6%)	5 (13.5%)	5 (18.5%)
Prescription analgesics			
Yes	54 (84.4%)	32 (86.5%)	22 (81.5%)
No	10 (15.6%)	5 (13.5%)	5 (18.5%)
Past major illnesses			
Yes	49 (80.3%)	30 (81.08%)	19 (70.37%)
No	15 (19.7%)	5 (13.52%)	7 (25.93%)

Table 3 Psychosocial and health care utilization measures

	Total sample	Completers	Non-completers
	Mean (SD)	Mean (SD)	Mean (SD)
CES-D	18.98 (13.18)	20.87 (13.98)	15.50 (10.97)
PCS	32.84 (14.79)	31 (15.65)	35.37 (13.39)
QLS	30 (10.6)	30.57 (10.56)	29.22 (10.82)
RMDS	9.25 (2.82)	9.14 (2.51)	9.39 (3.23)
Visits pre-Rx	1.77 (1.4)	1.73 (1.5)	1.93 (1.3)
Average interval pre-Rx	34.35 (20.07)	25.87 (19.32)	33.69 (25.62)
Visits post-Rx	5.53 (4.01)	5.27 (3.98)	15.50 (10.97)
Average interval post-Rx	55.22 (49.67)	54.36 (29.17)	35.37 (13.39)

Table 4 Regression analyses for HCU

	R^2	F	β
Number of visits pre-treatment			
Depression			.362*
Catastrophizing			.004
Total R^2	.133	4.677*	
Average interval pre-treatment			
Catastrophizing			-.315[‡]
Quality of life			.233
Total R^2	.211	4.14**	
Number of visits post-treatment			
Perceived disability			.362[‡]
Catastrophizing			.099
Total R^2	.177	3.45*	
Average interval post-treatment			
Catastrophizing			-.339
Perceived disability			-.259
Total R^2	.249	3.81*	

*$p<0.05$, **$p<0.01$, ‡$p=0.06$ (trending towards significance).

Table 5 Logistic regression predicting treatment completion

	B	*SE*	Wald	*df*	*p*	Odds Ratio	95% CI for odds ratio	
							Lower	Upper
Education	.307	.144	4.534	1	.033*	1.359	1.025	1.802
Depression	.159	.052	9.572	1	.002**	1.173	1.060	1.297
Catastrophizing	-.089	.037	5.900	1	.015*	.915	.851	.983
Quality of life	.092	.046	3.966	1	.046*	1.097	1.001	1.201
Perceived disability	.099	.133	.556	1	.456	1.104	.851	1.433
Constant	-7.109	2.997	5.627	1	.018	.001		

*p<0.05, **p<0.01