Patient–centered Self-management of Chronic Pain Improves Patients' Self-efficacy

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Abstract

Objective: The objective of this study was to examine improvements in patients' wellbeing while receiving care in the Chronic Pain Management Program.
Methods: We conducted a prospective chart review of 87 patients seen from January 2013-June 2015. We examined patients' socio-demographics (age, sex, insurance status) and completion of initial program components (yes/no) within two visits: substance abuse risk assessment, urine drug screen, provider's review of North Carolina Controlled Substance Registry, controlled substance use agreement, and patient-centered, self-management goals. We also assessed appropriate prescribing of medication (recommended dosage and type), program duration and intensity (number of visits), and group participation. Changes from intake to follow-up $\geq$ 6 months were analyzed for patients' self-rated average pain over the past week (1-10; "none to worst") and self-efficacy (Nicholas' Pain Self-Efficacy Questionnaire (PSEQ); 0-60; "not to completely confident"). Self-management components of the program were examined to predict improvements using binary logistic regression models.
Results: Completion rates for program components ranged from 55.2% (controlled substance use agreement) to 98.9% (urine drug screen). Appropriate prescribing of medication improved significantly ($p = 0.039$). Pain scores did not change significantly ($p = 0.753$). PSEQ scores improved significantly ($p = 0.019$). Significant predictors of appropriate prescriptions included less time in the program ($p = 0.002$) and participation in the optional group visits ($p = 0.007$). Significant predictors of PSEQ improvements included appropriate prescriptions ($p = 0.006$) and completed patient-centered, self-management goals ($p = 0.007$).
Conclusions: This study demonstrates the potential of the multifaceted program to offer opioid using patients with chronic pain the necessary evidence-based healthcare, structure, and support to improve the quality of their lives. Increased emphasis on appropriate prescribing, participation in group visits, and more consistent completion of self-management goals may help more patients improve their self-efficacy for functioning and coping with chronic pain and shift to safer medication regimens.

Key Words: Chronic pain; Treatment outcome; Self-efficacy; Pain management

Introduction

Over the past 25 years, as prescriptions for opioids in the Unites States have nearly tripled, the use and deadly misuse of opioids has skyrocketed.[1] Chronic pain costs the United States approximately $635 billion per year in lost productivity and medical treatment, making it one of the most expensive health problems in the nation.[2] According to the Centers for Disease Control and Prevention, North Carolina ranks among the top 13 states in the nation for prescription opioids, with a rate of 97 prescriptions per 100 individuals.[3] As the number of people with chronic pain continues to rise, there is an imminent need to plan for more effective, efficient, and affordable chronic pain treatment.

Current research and practice offer new treatment strategies for chronic pain sufferers. Multimodal approaches shown to be effective include group and/or individual instruction in pain management strategies,[4-12] patient education on the physiology and psychology of pain, [4-,6-12]physical therapy, [4,6,9,13-15]psychotherapy, [4,6,9,13]medication management, [4,6-12]and cognitive behavioral therapy. [4,6,9,13-14]Evidence from model programs indicates significant reductions in number of prescriptions for controlled substances, emergency room visits, accidental drug overdoses with prescription opioids, and costs to publicly funded healthcare programs, as well as the overall healthcare system.[16]

With a Healthcare Innovation Challenge Award from the Centers for Medicare and Medicaid Services, western North Carolina-based Mountain Area Health Education Center (MAHEC) developed and implemented the Chronic Pain Management Program (CPMP) to provide multimodal, multidisciplinary evidence-based care for patients diagnosed with chronic pain and using opioids. The objective of this study was to examine improvements in patients' wellbeing while obtaining care in the CPMP.

Methods

Intervention

The study took place at MAHEC's Family Health Center. The CPMP clinic was staffed four half-days per week by a nurse practitioner and a medical assistant. A board-certified family medicine physician served as the Medical Director of the CPMP and provided clinical supervision. The evidence-based, standardized, nine-point care model included:

1. A substance abuse risk assessment using a standardized interview at intake and periodic urine drug screening;
2. Regular provider review of the North Carolina Controlled Substance Registry (NCCSR) for opioid prescriptions;
3. Utilization of a controlled substance use contract that included patient agreement to utilize the CPMP provider or their MAHEC primary care provider exclusively for opioid prescriptions;
4. Appropriate opioid prescription guidelines: maximum daily dosage of ≤100 morphine milligram equivalents (MME) and extended-release (long acting), medications for scheduled maintenance and short acting medications as needed (PRN) for breakthrough pain control;
5. Provision of patient education and counseling by the CPMP provider, licensed social workers and/or clinical pharmacists, as needed;
6. Development of patient-centered, self-management goals;
7. Ongoing assessment of wellbeing, including: pain level, medication side effects, self-efficacy for functionality and coping, and behavioral health symptoms;
8. Participation at required individual medical visits minimally every 90 days, and more frequently as clinically indicated; and
9. Participation in optional CPMP group medical visits.

Patients had to be ≥18 years old, without an active substance use diagnosis, and with a diagnosis of chronic pain syndrome (ICD-9 338.4). Patient adherence to pain medication regimen was monitored

regularly via pill counts, urine drug screening, and verification of prescriptions filled via the NCCSR. Self-reported pain levels, side effects and other concerns, self-efficacy with functioning and coping, and progress towards self-management goals were monitored at each visit.

Study

Using a pre- vs. post-intervention design, we conducted a prospective chart review of 87 patients who participated in the CPMP from January 2013 – June 2015 and who had a minimum of 180 days between the first intake and the latest follow-up visit for chronic pain. We excluded patients seen in the CPMP for only one consultation visit (n = 128) and those without follow-up > 6 months (n = 180). The primary outcomes were: change in the percent of patients receiving appropriate prescriptions, patients' self-reported pain scores, and patients' self-reported self-efficacy for coping and functioning with chronic pain. This prospective, chart review project was approved by the Mission Health Institutional Review Board; written informed consent for the project was waived.

Data Extraction

Program participants. We extracted patients' socio-demographics (age, sex, insurance status).

Care model components. We noted provider completion (yes/no) of initial program components within two visits, including: substance abuse risk assessment, urine drug screen, review of the NCCSR, and controlled substance use agreement. We also noted whether there was documented evidence of the patient-centered, self-management goals.

Appropriate prescribing. We calculated the rate of appropriate prescribing (yes/no) at intake and the most recent follow-up visit for chronic pain. Appropriate prescribing combined the type of prescription and MME. MME was calculated using prescribed maximum doses of both scheduled and as needed medications.[17-18] Appropriate prescribing occurred if the patient was given extended-release or long acting medication as a scheduled prescription, and if the dosage total was ≤ 100 MME.

Patient Self-Report of Pain and Self-Efficacy. At intake and most follow-up appointments, patients completed a self-reported pain scale of average pain over the past week (1-10; "none" to "worst"), and the Nicholas' Pain Self-Efficacy Questionnaire (PSEQ).[19] The PSEQ is a 10-item self-rating instrument with a 7-point confidence scale (0-6; "not at all" to "completely confident"), which assessed self-efficacy with statements such as: "I can enjoy things, despite the pain," and "I still accomplish most of my goals in life, despite the pain." Scores range from 0 to 60; normative means and standard deviations for chronic pain patients are: pre-treatment = 19.3 ± 10.8 / post-treatment = 32 ± 12.6.[19]

Program Participation. Three types of measures were used to calculate program participation: 1) Duration: a. Program duration = days from intake to most recent appointment for chronic pain, b. Duration between pain assessments = days from initial to most recent assessment of pain, and c. Duration between self-efficacy assessments = days from initial to most recent assessment of PSEQ; 2) Intensity = number of individual and group visits; and 3) Group attendance = whether or not the patient had chosen to participate in the optional CPMP group medical visits.

Data Analysis

The percent of patients for whom program components were completed by the end of the second visit were described. Changes from intake to most recent follow-up ≥ 6 months were analyzed using the McNemar's test for appropriate prescribing, the Wilcoxon test for pain, and the dependent t-test for PSEQ scores. We used Spearman correlation to examine the relationships of changes in pain and PSEQ scores with appropriate prescribing at the most recent follow-up visit.

To understand if specific patient-centered components in the CPMP were related to improvements while controlling for the effect of all components of the program, we used a binary logistic regression to examine appropriate prescribing at follow-up in relation to duration (program duration) and intensity,

group attendance, and existence of self-management goals. We examined these covariates using the appropriate duration between score assessment and appropriate prescriptions (yes/no) on the change in PSEQ scores using multivariate linear regression. No regression was run for changes in pain scores, as no significant change was found.

Results

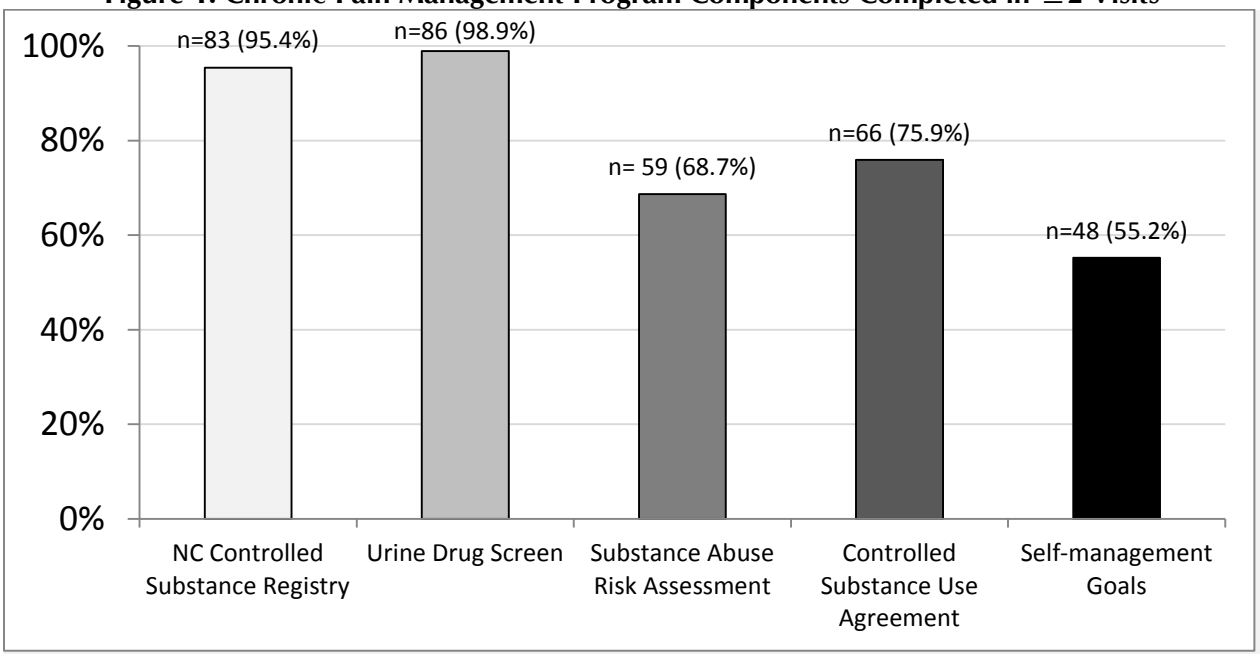
The median age of the 87 study participants was 58 years old. More than half of the participants were women (65.5%), and the majority were Medicare or Medicaid beneficiaries (78.2%). Median duration of follow-up was 405 days (see Table1).

Table 1. Chronic Pain Management Program Patient Demographics and Program Participation

	N = 87 (%)
Sex	
Male	57 (65.5)
Female	30 (34.5)
Insurance	
Medicare/Medicaid	68 (78.2)
Private Insurance	17 (19.5)
Self-pay/None	2 (2.2)
	Median (min-max)
Age	58 (28-83)
Days of CPMP Involvement	405 (182-887)
Total Individual Visits	5 (2-24)
Total Group Visits, n = 29 (33.3%)	2 (1-12)

For the majority of patients, the initial program components were completed by the end of second visit, although rates of completion varied (see Figure1).

Figure 1. Chronic Pain Management Program Components Completed in ≤2 Visits



Only a slight majority, 48 (55.2%) of the patients, had worked with their provider to complete the patient-centered, self-management goals.

Appropriate prescribing improved significantly, from 60 (69.0%) to 68 (78.2%) patients ($p = 0.039$; see Figure2). Pain scores did not change significantly ($p = 0.753$). PSEQ scores improved significantly ($p = 0.019$; see Figure3).

Changes in PSEQ scores were negatively related to pain scores; this relationship was significant yet weak ($r = -0.297$, $p = 0.009$). Neither changes in PSEQ nor pain were significantly related to appropriate prescribing ($p = 0.735$ and $p = 0.162$, respectively).

Figure 2. Appropriate Prescribing at Intake vs. Follow-up

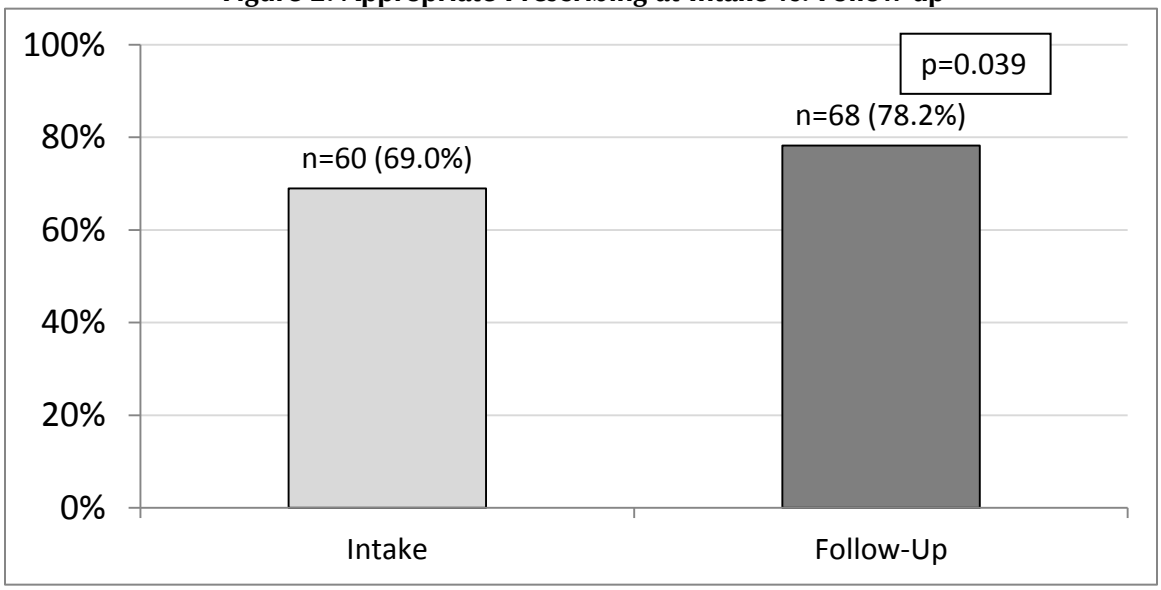
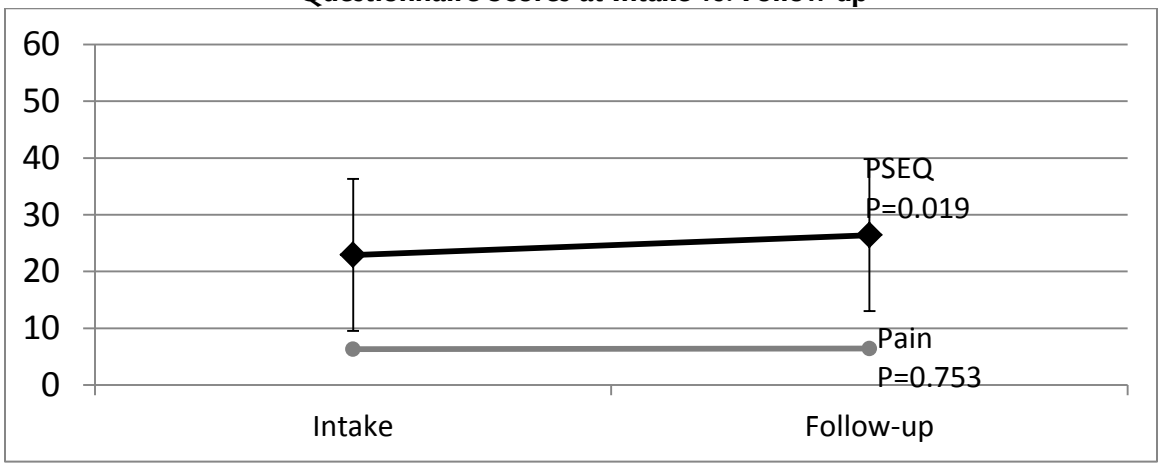


Figure 3. Improvements in Well-being: Pain & Pain Self Efficacy Questionnaire Scores at Intake vs. Follow-up



Regression models were run for improvements in appropriate prescribing and PSEQ; pain scores did not improve, so no regression was conducted. Significant predictors of receiving appropriate prescriptions included a shorter duration of time in the program ($p = 0.002$) and participation in the optional CPMP group medical visits ($p = 0.007$; see Table2).

Table 2. Predictors of Appropriate Prescribing

Variables	Referent	Odds ratio	95% Confidence Interval
Duration in program (182 – 887 days)	--	0.990	0.983, 0.996
Total visits (2 – 24 visits)	--	0.980	0.860, 1.115
Group attendance	None	0.072	0.011, 0.480
Self-management goals completed	None	0.955	0.225, 4.058

Significant predictors of changes in PSEQ included receiving appropriate prescriptions ($p = 0.006$) and having completed patient-centered, self-management goals within the first two visits to the CPMP ($p = 0.007$; see Table3).

Table 3. Predictors of Improvements in Pain Self-Efficacy Questionnaire Scores (PSEQ)

	Standardized Beta	p
Appropriate prescriptions	0.328	0.006
Duration of time between baseline and following PSEQ assessment	-0.114	0.511
Total visits	0.114	0.526
Group attendance	-0.058	0.654
Self-management goals completed	0.335	0.007

Discussion

Self-efficacy in functioning and coping with chronic pain significantly improved for patients participating in the CPMP for a minimum of six months. Also, appropriate prescribing improved with no reduction in pain control. Improvements to patients' quality of life is an acknowledged "successful outcome" of chronic pain treatment.[20] While the magnitude of improvement is less than expected (CPMP mean difference = 3.5 vs. norm mean difference = 12.7)[19], improvement is consistent with published patient outcomes from multimodal pain management programs.[5,7,11-12,19,21-23]

Improvements in self-efficacy, particularly, have been noted in studies of pain management programs in the United States, Germany, Hong Kong, and China. Osteoarthritis pain-specific studies by Broderick et al., Yip et al., and Goeppinger et al. reported increased levels of self-efficacy among participants of multimodal interventions, with Broderick et al. noting significant improvements compared to a control group ($p < 0.001$); [5,7,12]

We also found significantly more CPMP patients had received appropriate prescriptions at greater than 180 days follow-up than at first visit to the CPMP. Likewise, Broderick et al. and Wilson et al. found reduced use of pain medication in patients who participated in multimodal interventions compared to control ($p = 0.028$ and $p = 0.04$, respectively). [5,11] Nevertheless, approximately 1 in 5 CPMP patients still had medication regimens that had a higher than ideal MME. And, it must be noted that 2016 CDC guidelines for appropriate prescribing now recommend a lower dosage (< 90 MME), which would increase the percentage of our patients requiring provider justification for a high-risk prescription.[24]

It is conceivable that patients with lower self-efficacy for functioning and coping with chronic pain might be more resistant to changing prescriptions and reducing pain medications. These patients might require a longer course of treatment prior to establishing self-management goals that would include medication changes and reductions.

We did find that patients' improved self-efficacy was related to being on appropriate prescriptions (≤ 100 MME) and to the development of patient-centered, self-management goals early in treatment

(within the first two visits). Further, being on appropriate prescriptions was related to group medical visit participation and a shorter duration of time in the CPMP.

Other researchers have also reported effectiveness of self-management and/or group participation on patient outcomes. Hutting et al. found that compared to chronic pain patients who received usual care, chronic pain patient participants in a self-management intervention experienced significantly fewer limitations in work-related activities.[8] In a comparison of an online, self-management group versus treatment-as-usual among non-cancer pain patients with current opioid prescriptions, Wilson et al. reported significantly greater progress towards stated medication goals, and small but non-significant improvements in self-efficacy (PSEQ).[11] Gardiner et al. found that women suffering from chronic pain who participated in an integrative medical group visit care model showed significant changes in pain, depression, sleep quality, and perceived stress.[25] Geller and his colleagues similarly found significant improvements for chronic pain sufferers enrolled in an empowerment-based group visit model on self-rated health, pain, social function, and mental health.[26]

We did not find improvements in pain scores. Despite pain reduction also being an acknowledged "successful outcome,"[20] the evidence on effectiveness of multimodal pain treatment strategies in reducing pain is mixed. Gatchel et al. reported in their review of comprehensive pain management programs that results vary in degree of pain reduction, from 14% to 60% (average 20% to 30%).[22] Research by Becker et al., Broderick et al., Burnham et al., Goeppinger et al., and Tse et al. (2013 and 2016) found significant reductions in pain and/or pain frequency and intensity among intervention participants suffering from chronic non-malignant pain, osteoarthritis pain of knee or hip, spinal pain, arthritis pain, and other mixed, unspecified types of pain. [4-7,10,15] Other studies by Hutting et al. and Lang et al., which examined patients with non-specific complaints of arm, neck, or shoulder pain, and patients with low back pain, found results equivalent to ours: no significant change in pain scores.[8-9] Further, a systematic review of registered controlled trials studying multidisciplinary treatments for chronic pain by Scascighini et al. noted pain measurement was rarely reported as a primary outcome (88.9%), and in studies that did report pain outcomes, patients with fibromyalgia and chronic back pain tended to see better outcomes than patients with diverse origins of pain.[23] Our CPMP patients did have diverse origins of pain.

The generalizability of our findings is limited by the observational design of the project and the small sample size of patients due to a high percentage of patients not completing six months of the program. Further, this project evaluates patients in one treatment program at one location. As such, results may not apply to other types of medical practices (e.g., non-residency-based), medical specialties (e.g., Internal Medicine) or in other areas of the country and world. This study is also limited by varying levels of patient involvement in the program; however, we found no relationship between program duration or intensity and pain or self-efficacy improvements. This is not uncommon; Scascighini et al.'s systematic review, as well as Flor et al.'s meta-analysis of multidisciplinary treatment programs for patients with chronic low back or heterogeneous pain both found no evidence that a specific type of intervention, setting, or duration of participation resulted in superior outcomes.[21,23] Nevertheless, six months may not be sufficient follow-up time for patients with long-standing chronic pain and established medication regimes to make substantial changes. Furthermore, patients' readiness for change was not taken into account,[27] as recommended by Zimmerman et al.[28]

Conclusions

This study demonstrates the potential of the multifaceted CPMP to offer opioid-using patients with chronic pain the necessary evidence-based healthcare, structure, and support to improve the quality of their lives. Increased emphasis on appropriate prescribing, participation in group visits, and more consistent completion of self-management goals may help more patients improve their self-efficacy for functioning and coping with chronic pain and shift to safer medication regimens.

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