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Use of self-management interventions for chronic pain management: A comparison between rural and non-rural residents

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Abstract

Background—Individuals with chronic pain who live in rural communities often lack access to pain specialists and rely on primary care providers who may be less prepared. Research has shown that rural residents with chronic pain are more likely to receive an opioid prescription than non-rural residents. Although self-management approaches are available for chronic pain management, it is unclear to what extent rural residents use these interventions.

Aims—This study compares usage of self-management interventions and opioid-based analgesics for chronic pain management between rural and non-rural residents.

Design—This study is a secondary analysis of baseline data from a randomized controlled trial evaluating a telehealth intervention for chronic pain management.

Participants—Participants were 65 rural residents and 144 non-rural residents with similar demographic characteristics.

Methods—Differences in the use of self-management interventions, pain intensity, and opioid dose were evaluated between rural and non-rural residents.

Results—Rural residents ($n = 50$, 77%) were less likely to use self-management interventions compared to non-rural residents ($n = 133$, 92%) ($p = 0.019$). Opioids were taken for pain relief by 76% of the rural residents compared to 52% of the non-rural residents.

DISCUSSION—A disparity exists in the use of self-management interventions for chronic pain management by rural residents compared to non-rural residents. Further study is needed to determine if this is related to the lack of access to specialists and/or pain management training of primary care providers. Nurses can play an essential role in addressing this disparity by educating patients about self-management interventions.

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Keywords

Chronic pain; self-management interventions; rural; opioids; primary care

Background

Chronic pain is a common problem and a challenge to treat effectively. It is estimated that chronic pain affects 116 million adults in the U.S. population (IOM, 2011) and is the most frequent reason for seeking health care (Daubresse et al., 2013). Chronic pain is best treated using a multi-modal interdisciplinary approach which may include both pharmacologic and non-pharmacological self-management interventions (Tompkins, Hobelmann, & Compton, 2017). Disparities may exist in the management of chronic pain in rural communities due to lack of access to primary care providers (PCPs) who have had formal training in chronic pain management. As a result, rural residents may rely solely on PCPs who are often less prepared to manage chronic pain using self-management interventions (Mezei & Murinson, 2011). Moreover, rural residents have a higher likelihood of being prescribed an opioid analgesic compared to non-rural residents (Prunuske et al., 2014). Although self-management interventions are an important part of managing chronic pain, it is unknown to what extent rural residents currently use these interventions compared to non-rural residents.

Self-Management Interventions

Complementary and alternative medicine (CAM) therapies may be used in addition to pharmacologic interventions to reduce chronic pain. The National Center for Complementary and Integrative Health (NCCIH) categorizes complementary self-management approaches into two categories: as mind and body therapies (i.e., yoga, meditation, exercise, acupuncture, relaxation techniques) and natural products (i.e., herbs, vitamins, minerals) (NCCIH, 2017). Rural residents may lack access to complementary self-management interventions (Hoffman, Meier, & Council, 2002), while pharmacologic interventions are readily available and better covered by insurance (IOM, 2011).

A lack of current research exists on the use of complementary self-management interventions for chronic pain management among rural and non-rural residents. In a 2003 study, a significant relationship ($\chi^2 = 19.72$, $p = .001$; $n=595$) was found between the use of complementary self-management approaches for pain management and type of community, with 82% of suburban, 77% of urban and 58% of rural respondents reporting the use of these treatments (Vallerand, Fouladbakhsh, & Templin, 2003). Of the rural residents, 66% used prescription medications and 18% were taking an opioid analgesic (Vallerand, Fouladbakhsh, & Templin, 2004). The percentage of suburban and urban residents who used prescription medications and opioid analgesics was not reported. Findings from a 2008 survey of 463 patients with chronic nonmalignant pain who received primary care at 12 U.S. academic medical centers in non-rural settings showed that 52% of patients used complementary self-management approaches to manage their chronic pain (Rosenberg et al., 2008). No association was found between opioid use and self-management intervention utilization.

Chronic Pain Management in the Primary Care Setting

At the patient level, facilitators of patient's chronic pain management in the primary care setting include confidence in one's self-management ability, relationship with their PCP, support from family and friends, and access to services (Lukewich, Mann, VanDenKerkhof, & Tranmer, 2015). Self-management interventions engage individuals to manage their chronic pain. Thus, self-management interventions are an important component of chronic pain management and promote patients to be active participants in their treatment rather than relying only on pharmacologic interventions which are often opioid-based (Olsen, Daumit, & Ford, 2006; Boudreau et al., 2009).

At the community level, the use of complementary self-management interventions for chronic pain management by rural residents can be explained by the Chronic Care Model (Bodenheimer, Wagner, & Grumbach, 2002). The model is an organizational approach for providing high-quality chronic disease care in the primary care setting. Treating chronic pain has similarities to treating other chronic diseases that are managed in the community, health care system, and provider organization, such as a rural clinic (Bodenheimer et al., 2002). High-quality pain care that includes the use of self-management interventions is supported by six essential elements: (1) linkages between PCPs and community resources for self-management interventions such as exercise classes, (2) a health care organization that views multi-modal chronic pain management as a priority, (3) self-management support that emphasizes the patient's role in managing chronic pain and empowers patients to use self-management interventions, (4) a delivery system that defines the roles and tasks of team members for educating patients about pain intervention options, (5) decision support for integration of evidence-based pain care in daily practice, and (6) clinical information systems for reminding providers about evidence-based care and providing feedback on the outcomes of using self-management interventions. These interrelated elements result in evidence-based interactions between an informed, empowered patient and a knowledgeable, proactive health care team (Bodenheimer et al., 2002). Therefore, the absence of elements of the Chronic Care Model in the rural setting such as resources, health insurance coverage for complementary self-management approaches, and relative lack of knowledge of evidence-based selfmanagement interventions among PCPs may reduce the likelihood of patients using complementary self-management interventions.

Study Objectives

To determine if there is a difference in chronic pain management in the rural setting, the objective of this study is to compare the use of complementary self-management interventions and opioid-based analgesics between rural and non-rural residents with chronic pain. Based on previous research findings, we believe that rural residents will report lower use of self-management interventions and higher use of opioid-based analgesics than non-rural residents.

Methods

Design

This is a secondary analysis of baseline data from a randomized controlled trial (Author Publication 1, Author publication 2, Author publication 3). This analysis evaluated a subset of the sample based on whom self-management intervention data were available. The study was approved by the University of Washington Institutional Review Board.

Sample

The study participants included patients recruited from clinics in rural and non-rural areas in Montana, Oregon, Wyoming, and Washington State. Rural is defined as a (1) medically underserved area (Kapoor & Thorn, 2014) as designated by the Health Resources and Services Administration Data Warehouse (<https://datawarehouse.hrsa.gov/tools/analyzers/nuafind.aspx>) and (2) community size of fewer than 25,000 residents.

Patients were eligible for the study if they (a) were ≥ 18 years of age, (b) had been diagnosed with chronic nonmalignant pain, (c) had been seen by the PCP in the past 2 months, (d) had functional fluency in English, (e) had no or only mild cognitive impairment, and (f) had no problems communicating by phone because of hearing assistive devices.

Instrumentation and Data Collection

Eligible patients were asked by their PCP if they were interested in being contacted about the study. If patients agreed to be contacted by the research team, they were reached by phone to confirm study eligibility, obtain informed consent, and collect baseline patient reported demographics, use of pain management interventions, and pain intensity.

Demographics—The demographic questionnaire was developed for this study to collect information about sex, age, ethnicity, education, and relationship status.

Pain Management Interventions—Use of complementary self-management interventions and opioid analgesic dose were obtained through an investigator-developed questionnaire. The self-management intervention item was derived from the Revised American Pain Society Patient Outcome Questionnaire (APS-POQ-R) (Gordon et al, 2010). This questionnaire is designed to measure aspects of pain management quality including use of nonpharmacological strategies. Respondents are asked if they use non-medicine methods to relieve pain. If yes, they are asked to check all that apply from the list of interventions (Table 2).

Pain Intensity—Using PainTracker™, a web-based patient-reported outcomes tool (Schorn, Doorenbos, Gordon & Read-Williams, 2014), participants rated their pain intensity on average in the past week on a 10-point numeric scale. The PainTracker™ assessment includes the valid and reliable Pain Intensity, Enjoyment of Life, and interference with General Activity (PEG) numeric scales (Krebs et al., 2010).

Data Analysis

Descriptive statistics were used to report the demographics, use of pain management interventions, and pain intensity. To test for a difference in use of any self-management intervention and use of opioid-based analgesics between rural and non-rural residents (i.e., binary yes/no outcome variables), two mixed-effect logistic models were used. The random effect of “clinic” was included in both models to account for within-clinic correlation between patients and the fixed effect of community type (i.e., rural/non-rural) in each model was evaluated. A p-value less than 0.05 was considered statistically significant.

Results

Participants

The participants were 65 rural residents and 144 non-rural residents who had similar demographic characteristics (Table 1). They were predominantly Caucasian females with an average age of 52 years (SD = 15.1 years). Almost 50% had only a high school degree and almost 50% had a college education. More rural residents were not married (60%) compared to non-rural residents (42%). Average pain intensity was similar with a moderate level of 6.4 (SD = 1.7) for rural residents and 6.1 (SD = 1.9) for non-rural residents. However, the use of complementary self-management interventions was significantly different between rural (77%) and non-rural residents (92%) (OR=0.30, $p = 0.019$). In addition, opioid analgesics were taken by 76% of the rural residents compared to 52% of the non-rural residents although this difference was not statistically significant when accounting for clustering by clinic (Table 3). Of those taking opioids for pain relief, approximately 20% of participants were taking high dose opioids (>120 MED per day), regardless of rural or non-rural residence.

Self-Management Interventions

Both rural and non-rural residents used a variety of self-management interventions. Among those study participants who used self-management interventions to manage their pain, thermal (heat and cold) and distraction interventions were the most common (Table 2). The use of TENS (transcutaneous electrical nerve stimulation) was the most common “other” intervention described among both groups (n=16, 13%). Other common interventions were yoga by non-rural residents (n=12, 14%) and acupuncture (n=5, 14%) by rural residents.

Discussion

In this study, we confirmed a disparity in the use of complementary self-management interventions by type of community. A higher proportion of non-rural patients with chronic pain used complementary self-management interventions compared to rural patients with chronic pain. Although this disparity exists, the use of self-management interventions by rural residents may be increasing, given we found a greater percentage of rural residents using self-management interventions compared to previous research (Vallerand et al., 2003). This finding may be a result of an increase in scientific evidence and public knowledge over the last decade regarding the use of complementary self-management interventions for pain management.

Even with increased awareness, accessibility of self-management interventions may be limited in the rural setting if the intervention requires a trained clinician for implementation. Our questionnaire focused on interventions that could be implemented independently by the patient. Interventions such as acupuncture, cognitive behavioral therapy, hypnosis, and physical therapy which require a trained clinician were only captured if the participant identified them as an “other” intervention.

Our belief that rural residents were more likely to be taking an opioid-based analgesic for chronic pain management was supported and similar to what has been previously reported (Prunuske et al., 2014). Although not statistically significant, opioids were taken for pain relief more frequently by rural residents than non-rural residents. However, the proportion of patients on high-dose opioids did not differ between the groups (20%). Patient safety issues increase when opioid doses are greater than 90 MED per day and require knowledgeable providers who can taper doses in an appropriate manner. The TelePain™ intervention tested in our primary study educates providers on optimal and safe pain management practices such as opioid dosing and self-management interventions regardless of geographical location (Author Publication 1, Author publication 2). Increased use of telehealth interventions like TelePain may support rural PCPs in decreasing opioid doses by increasing the use of self-management interventions to manage chronic pain.

As recognized by the Chronic Care Model, an essential element for providing high-quality pain care is the identification of key members of the health care team who will be responsible for educating patients about opioid-based analgesics and complementary self-management interventions for chronic pain. Because self-management interventions typically do not require a prescription, nurses are well-suited to educate patients with chronic pain about these interventions while PCPs, such as physicians, nurse practitioners, and physician assistants, are better trained for pharmacological interventions, including opioid-based analgesics. Working together as an informed health care team to provide optimal pain management interventions will lead to better self-management of chronic pain by rural residents.

Implications and Conclusions

Findings from this study have implications for nursing practice. Nurses can play a vital role in increasing the use of self-management interventions for chronic pain management among rural residents by educating patients and promoting self-management. Nurses who work in primary care should understand the scientific evidence for self-management interventions, the patient’s preferences, and any safety or accessibility issues in using these interventions. For example, yoga may be a self-management intervention that a patient is interested in using, but classes provided by a trained instructor may not be easily accessible in the rural setting. If the patient considers using a yoga DVD, for example, the nurse needs to ensure that the yoga provided by this method is safe and appropriate for the patient.

In conclusion, complementary self-management interventions are an important part of chronic pain management. The Chronic Care Model identifies essential elements that should be present in the primary care setting to ensure that patients receive optimal pain care that

includes self-management interventions. All individuals with chronic pain should be knowledgeable and have access to these interventions regardless of geographical location.

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References

- Author publication 1
 Author publication 2
 Author publication 3
- Bodenheimer T, Wagner EH, Grumbach K. Improving primary care for patients with chronic illness. *JAMA*. 2002; 288(14):1775–1779. [PubMed: 12365965]
- Boudreau D, Von Korff M, Rutter CM, Saunders K, Ray GT, Sullivan MD, ... Weisner C. Trends in long-term opioid therapy for chronic non-cancer pain. *Pharmacoepidemiology Drug Safety*. 2009; 18(12):1166–1175. [PubMed: 19718704]
- Daubresse M, Chang HY, Yu Y, Viswanathan S, Shah ND, Stafford RS, ... Alexander GC. Ambulatory diagnosis and treatment of nonmalignant pain in the United States, 2000–2010. *Medical Care*. 2013; 51(10):870–878. DOI: 10.1097/MLR.0b013e3182a95d86 [PubMed: 24025657]
- Furlong WJ, Feeny DH, Torrance GW, Barr RD. The Health Utilities Index (HUI) system for assessing health-related quality of life in clinical studies. *Annals of Medicine*. 2001; 33(5):375–384. [PubMed: 11491197]
- Gordon DB, Polomano RC, Pellino TA, Turk DC, McCracken LM, Sherwood G, ... Farrar JT. Revised American Pain Society Patient Outcome Questionnaire (APS-POQ-R) for quality improvement of pain management in hospitalized adults: preliminary psychometric evaluation. *The Journal of Pain*. 2010; 11(11):1172–1186. [PubMed: 20400379]
- Hoffman PK, Meier BP, Council JR. A comparison of chronic pain between an urban and rural population. *Journal of Community Health Nursing*. 2002; 19(4):213–224. DOI: 10.1207/s15327655jchn1904_02 [PubMed: 12494742]
- IOM (Institute of Medicine). *Relieving pain in America: a blueprint for transforming prevention, care, education, and research*. Washington, D.C: The National Academies Press; 2011.
- Kapoor S, Thorn BE. Healthcare use and prescription of opioids in rural residents with pain. *Rural Remote Health*. 2014; 14(3):2879. [PubMed: 25204693]
- Krebs EE, Bair MJ, Damush TM, Tu W, Wu J, Kroenke K. Comparative responsiveness of pain outcome measures among primary care patients with musculoskeletal pain. *Medical Care*. 2010; 48(11):1007–1014. [PubMed: 20856144]
- Lukewich J, Mann E, VanDenKerkhof E, Tranmer J. Self-management support for chronic pain in primary care: a cross-sectional study of patient experiences and nursing roles. *Journal of Advanced Nursing*. 2015; 71(11):2551–2562. DOI: 10.1111/jan.12717 [PubMed: 26118587]
- Mezei L, Murinson B. Pain education in North American medical schools. *Journal of Pain*. 2011; 12(12):1199–1208. [PubMed: 21945594]
- National Center for Complementary and Integrative Health (NCCIH). *Complementary, alternative, or integrative health: what's in a name?*. 2017. Retrieved from <https://nccih.nih.gov/health/integrative-health>
- Olsen Y, Daumit GL, Ford DE. Opioid prescriptions by U.S. primary care physicians from 1992–2001. *Journal of Pain*. 2006; 7(4):22–235.
- Prunuske JP, St Hill CA, Hager KD, Lemieux AM, Swanoski MT, Anderson GW, Lutfiyya MN. Opioid prescribing patterns for non-malignant chronic pain for rural versus non-rural US adults: a population-based study using 2010 NAMCS data. *BMC Health Services Research*. 2014; 14:563.doi: 10.1186/s12913-014-0563-8 [PubMed: 25407745]

- Rosenberg EI, Genao I, Chen I, Mechaber AJ, Wood JA, Faselis CJ, ... Pasanen M. Complementary and alternative medicine use by primary care patients with chronic pain. *Pain Medicine*. 2008; 9(8):1065–1072. [PubMed: 18564996]
- Schorn MM, Doorenbos AZ, Gordon D, Read-Williams P. Survey of Primary-Care Providers on Perceived Benefits of and Barriers to PainTracker. *The Journal for Nurse Practitioners: JNP*. 2014; 10(10):781–786. [PubMed: 25580098]
- Tompkins DA, Hobelmann JG, Compton P. Providing chronic pain management in the “Fifth Vital Sign” era: historical and treatment perspectives on a modern-day medical dilemma. *Drug and Alcohol Dependence*. 2017; 173(Supplement 1):S11–S21. doi:<https://doi.org/10.1016/j.drugalcdep>. [PubMed: 28363315]
- Vallerand AH, Fouladbakhsh JM, Templin T. Self-treatment of pain in a rural area. *Journal of Rural Health*. 2004; 20(2):166–172. [PubMed: 15085631]
- Vallerand AH, Fouladbakhsh JM, Templin T. The use of complementary/alternative medicine therapies for the self-treatment of pain among residents of urban, suburban, and rural communities. *American Journal of Public Health*. 2003; 93(6):923–925. [PubMed: 12773356]

Table 1

Demographic Characteristics of Rural and Non-rural Residents

Characteristic	Rural (n=65) n (%)	Non-rural (n=144) n (%)
Sex		
Male	20 (31)	52 (36)
Female	45 (69)	92 (64)
Age, Mean (SD)		
	52 (15.1)	51.9 (13.4)
Ethnicity		
American Indian/Alaska Native	0 (0)	1 (1)
Asian	0 (0)	2 (1)
African American	0 (0)	6 (4)
Caucasian	60 (92)	129 (90)
Multiple	4 (6)	3 (2)
Other/Unknown	1 (2)	3 (2)
Education		
No High School Degree	4 (6)	10 (7)
High School Degree	32 (49)	65 (45)
2-Year Degree	11 (17)	24 (17)
4-Year Degree	14 (22)	28 (19)
Graduate School	4 (6)	17 (12)
Relationship Status		
Married	26 (40)	84 (58)
Not Married	39 (60)	60 (42)
Pain Intensity, Mean (SD)		
	6.4 (1.7)	6.1 (1.9)
Use of Self-Management Interventions		
Yes	50 (77)	133 (92)
No	15 (23)	11 (8)
Opioid MED		
None	14 (24)	68 (48)
50	18 (31)	26 (18)
(50–90]	9 (15)	18 (13)
(90–120]	6 (10)	7 (5)
>120	12 (20)	24 (17)

Table 2

Types of Self-Management Interventions Used by Rural and Non-rural Residents

	Rural <i>n</i> (%)	Non-rural <i>n</i> (%)
Type of Intervention	50 (100)	133 (100)
Cold Pack	29 (58)	58 (44)
Heat	37 (74)	79 (59)
Massage	25 (50)	49 (37)
Walking	13 (26)	34 (26)
Deep Breathing	21 (42)	43 (32)
Distraction	25 (50)	60 (45)
Music	22 (44)	44 (33)
Prayer	19 (38)	34 (26)
Meditation	19 (38)	42 (32)
Relaxation	22 (44)	47 (35)
Imagery	13 (26)	27 (20)
Other	37 (74)	86 (65)

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Table 3

Mixed-effects Logistic Models of Pain Management Interventions

Pain Management Intervention	Odds Ratio Rural:Non-Rural OR (95% CI)	p-value
Use of self-management interventions	0.30 (0.10–0.81)	0.019
Use of opioid-based analgesics	1.48 (0.45–4.87)	0.520

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