7-1-2022

A brief psychological intervention for chronic pain in primary care: Examining long-term effects from a pilot randomized clinical trial

Lisa R. Miller-Matero
Henry Ford Health, lmatero1@hfhs.org

Lyubov Gavrilova
Henry Ford Health, lgavril3@hfhs.org

Leah M. Hecht
Henry Ford Health, lhecht24@gmail.com

Kirsti Autio
Henry Ford Health, kautio1@hfhs.org

Erin T. Tobin
Henry Ford Health, etobin1@hfhs.org

See next page for additional authors

Recommended Citation

Miller-Matero LR, Gavrilova L, Hecht LM, Autio K, Tobin ET, Braciszewski JM, Maye M, Felton JW, and Ahmedani BK. A brief psychological intervention for chronic pain in primary care: Examining long-term effects from a pilot randomized clinical trial. Pain Pract 2022.

Authors

Lisa R. Miller-Matero, Lyubov Gavrilova, Leah M. Hecht, Kirsti Autio, Erin T. Tobin, Jordan M. Braciszewski, Melissa Maye, Julia W. Felton, and Brian K. Ahmedani

DOI: 10.1111/papr.13134

RESEARCH ARTICLE

A brief psychological intervention for chronic pain in primary care: Examining long-term effects from a pilot randomized clinical trial

Lisa R. Miller-MateroPhD[1,2] | **Lyubov GavrilovaBS**[2] | **Leah M. HechtPhD**[2] | **Kirsti AutioMSW**[2] | **Erin T. TobinPhD**[1,3] | **Jordan M. BraciszewskiPhD**[1,2] | **Melissa MayePhD**[2] | **Julia W. FeltonPhD**[1,2] | **Brian K. AhmedaniPhD**[1,2]

[1]Behavioral Health, Henry Ford Health, Detroit, Michigan, USA

[2]Center for Health Policy and Health Services Research, Henry Ford Health, Detroit, Michigan, USA

[3]Internal Medicine, Henry Ford Health, Detroit, Michigan, USA

Correspondence
Lisa R. Miller-Matero, Behavioral Health, Henry Ford Health System, 1 Ford Place, 3A, Detroit, MI 48202, USA.
Email: lmaterol@hfhs.org

Funding information
Funding for this project was received from the Fund for Henry Ford Health System.

Abstract

Background: Despite the existence of evidence-based psychological interventions for pain management, there are barriers that interfere with treatment engagement. A brief intervention integrated into primary care reduced barriers and showed promising benefits from pre- to post-intervention. However, it is unknown whether a brief intervention can provide long-term effects. The purpose of this study was to examine whether a brief psychological intervention offered benefits in pain severity, pain interference, pain catastrophizing, and depressive symptoms at 1- and 6-month follow-ups.

Methods: The majority of participants who enrolled in a pilot randomized clinical trial of a 5-session psychological intervention for chronic pain in primary care completed the 1-month (n = 54; 90%) and 6-month follow-ups (n = 50; 83.3%). Participants completed measures of pain severity, pain interference, pain catastrophizing, and depressive symptoms.

Results: From baseline to the 6-month follow-up, those in the intervention group had significantly better outcomes for pain severity (p = 0.01) and pain catastrophizing (p = 0.003) compared with the control group. There were no significant differences between the intervention and control groups for pain interference and depression. The percentage of patients in the intervention experiencing clinically significant improvement across all outcomes was higher than the control group.

Conclusions: Findings suggest that a brief psychological intervention for chronic pain in primary care may offer longer-term benefits similar to that of lengthier interventions. Future studies should examine this through a randomized clinical trial with a larger sample size.

KEYWORDS
chronic pain, primary care, psychology, psychotherapy

Registered at Clinicaltrials.gov – NCT03692468

INTRODUCTION

Chronic pain is a debilitating condition that affects 50 million adults in the United States annually.[1] Chronic pain is highly comorbid with depression and anxiety,[2–4] which led to the rise in popularity of psychological interventions for chronic pain.[5] There are a variety of behavioral interventions for chronic pain management, including cognitive behavioral therapies (CBT), mindfulness, and acceptance and commitment therapy (ACT).[6] CBT seeks to alter the thoughts, emotions, and behaviors associated with the experience of pain.[7] Mindfulness training promotes awareness of the present moment without judgment and has been used for a variety of health concerns, including pain.[8] ACT expands upon mindfulness and encourages acceptance of living life and engaging in valued activities despite having pain.[9] These approaches target various factors to impact and influence patients' experiences of pain and have been shown to be effective for improving pain intensity, pain interference, pain catastrophizing, and mood.[9–14]

Despite the evidence for using psychological interventions for the management of chronic pain, multiple barriers for adherence with nonpharmacological treatments exist. For example, stigma, access (eg, transportation), patient skepticism about psychological pain treatment (eg, perceived lack of effectiveness), and the length and time commitment to treatment have all influenced the degree to which patients engage in psychological treatments for pain.[15,16] Because existing psychological interventions for chronic pain are lengthy (i.e., 8–12 sessions, 1–2 hours each), patients could be less likely to engage in these treatments.[10,17–19] A brief psychological treatment for chronic pain offered in a medical setting, such as within a primary care office where patients are already commonly seeking pain management,[20,21] has the potential to address these commonly cited barriers.

The integration of brief mental health services in primary care has been rapidly growing. There are a variety of models of integrated care, but a common theme is delivering time-limited mental health services through a primary clinic.[22,23] Integrated primary care appears to increase utilization of mental health treatment[24] and has been shown to significantly improve mental health symptoms.[25,26] Thus, a brief intervention integrated into primary care may offer similar benefits. As mentioned, CBT, mindfulness, and ACT have evidence-based components for pain management and related distress,[9–14] and these various options appear to be similarly effective.[14,27] Combining strategies from each of these interventions could offer a variety of evidence-based components in a single intervention while also allowing for delivery of the treatment in a brief format. Indeed, our brief, 5-session psychological intervention for patients with chronic pain delivered in a primary care setting was successful in engaging patients with high treatment adherence and resulted in improvements in pain and depression.[28] The intervention relied on evidence-based psychological components for chronic pain management, including cognitive behavioral, mindfulness, and acceptance-based strategies. Those in the intervention group experienced significant pre- to post-intervention improvements in pain severity, pain interference, pain catastrophizing, and depression, with medium-to-large effect sizes. Compared with the control group, significant improvements were also observed across pain severity, pain catastrophizing, and depression among those in the intervention group. Although the intervention showed these promising results, longer-term effects of a brief intervention have not yet been evaluated. Prior lengthier interventions have been shown to have longer-term positive effects after conclusion of the intervention.[29,30] Thus, in order to determine whether a brief intervention can also offer longer-term effects, the purpose of this paper was to examine 1-month and 6-month follow-up data from the brief psychological intervention.

METHODS

Participants

Sixty participants with chronic musculoskeletal noncancer pain lasting at least 3 months enrolled in a pilot randomized clinical trial (RCT) after seeking pain management in primary care.[28] Patients were excluded if they had cognitive impairment (diagnosed in their electronic health record) or had significant impairment on the Montreal Cognitive Assessment.[31] Patients were also excluded if they were currently attending psychotherapy to ensure effects were from this intervention and not additional treatment.

Measures

Demographics. At the baseline assessment, all participants completed a semi-structured interview. Participants reported their age, race, gender, marital status, years of education, and employment status.

Pain severity and interference were measured with the Brief Pain Inventory.[32] In this study, pain severity was defined as the average pain severity reported over the previous week on a 0–10 scale. Participants also rated the extent to which their pain interfered in daily functioning over the previous week on a 0–10 scale across 12 areas. An average score was calculated to produce an overall 0–10 score. For those in the intervention group, we also calculated a percentage of participants who experienced a clinically significant reduction in pain severity and pain interference, which is defined as at least a 30% reduction from the baseline rating.[33,34]

Pain catastrophizing, an exaggerated negative reaction toward the pain experience, was assessed by the

Pain Catastrophizing Scale.[35] This was measured because higher levels of pain catastrophizing are related to greater distress and pain severity.[35] Participants responded on a 5-point scale the degree to which they experienced catastrophizing thoughts or feelings. All items were added together to produce a total score.[36]

Depressive symptoms were measured with the Hospital Anxiety and Depression Scale in which patients reported the degree of anxiety and depressive symptoms they experienced over the previous week.[37] Though this measure assesses both anxiety and depression, for the current study, we only examined the depression subscale since there was not a significant finding for anxiety from baseline to post-intervention.[28]

Procedure

Patients were recruited for the pilot RCT during an appointment in a primary care clinic using the "warm handoff" model between September 2018 and February 2020. The primary care clinic is a large academic Internal Medicine primary care clinic located in an urban midwestern city. Study interventionists (two trained psychology postdoctoral fellows) identified potentially eligible patients based on a review of scheduled appointments, and the primary care provider introduced the study to the patient. If interested, one of the study interventionists further described the study and obtained informed consent. After completing baseline measures, participants were randomized into the intervention (n = 30) or treatment-as-usual control group (n = 30; see Figure 1 for CONSORT diagram). The intervention consisted of 5 (45 min) sessions. Sessions were composed of evidence-based strategies for chronic pain management (i.e., cognitive behavioral, mindfulness, and acceptance-based strategies). Strategies in the intervention included psychoeducation, diaphragmatic breathing, mindfulness, behavioral activation, and values-based discussion. Patients randomized to the intervention completed sessions in-person in the primary care clinic or through telemedicine (eg, video visits). After about half of participants enrolled, those in the intervention group could select to do in-person or video visits for the treatment sessions. This procedure was changed because there were patients who expressed interest in participating; however, reported barriers to being able to attend in-person visits (i.e., transportation and cost of parking). The participants in the treatment-as-usual control group were provided routine care that the primary care provider would normally offer (i.e., medications and referrals to other services). Additional detail about the intervention, eligibility, and enrollment is described in the previous paper reporting on effects of the intervention from baseline to post-intervention.[28] Participants completed measures at baseline, post-intervention, and at 1-month and 6-month follow-ups. We selected a 6-month follow-up since this is a common time point for assessment for psychological interventions for chronic pain.[10] Measures could be completed online or on paper/mailed, depending on the participant's preference. Participants were provided with incentives for completing measures at each time point and were reminded by study staff to complete measures up to 3 times for each assessment. This study was approved by the health system's Institutional Review Board.

Analyses

Frequencies were conducted to determine the rate of follow-up at each assessment. Independent samples t-tests and chi-square analyses were conducted to examine whether there was differential loss to follow-up among demographics between the intervention and control groups. Repeated measures ANOVAs were conducted to examine for differences between the intervention and control groups across the study period (i.e., baseline, 1-month, and 6-month follow-ups). If the repeated measures ANOVAs were significant, follow-up ANCOVAs were conducted to explore whether there were between-group differences at the 1-month and/or 6-month follow-ups, controlling for baseline scores. We also calculated the percentages of those who experienced clinically significant improvement (i.e., at least 30% improvement) at the 1-month and 6-month follow-ups.[33,34]

RESULTS

As reported in the prior paper, those randomized to the control group were more likely to identify as Black.[28] Otherwise, there were no significant differences in demographics between the intervention and control groups ($p > 0.05$). Of the 60 participants who enrolled in the pilot RCT, 90% (n = 54) completed measures at the 1-month follow-up and 83.3% (n = 50) completed the 6-month follow-up (Figure 1). Those not completing the 1-month follow-up were more likely to be younger (t = −2.06, p = 0.04), but otherwise there were no significant differences among other demographic variables (gender and race) and the 1-month and 6-month follow-ups ($p > 0.05$). See Table 1 for demographics of participants included at each follow-up time point. There were no differences between participants completing the 1-month and 6-month follow-up in the intervention and control groups for age, gender, or race ($p > 0.05$).

In the repeated measures ANOVAs, the intervention group had significantly better outcomes compared with the control group for pain severity and pain catastrophizing with medium-to-large effect sizes (Table 2). There were no statistically significant differences between the intervention and control groups for pain interference, and effect sizes were small (Table 2). Follow-up analyses

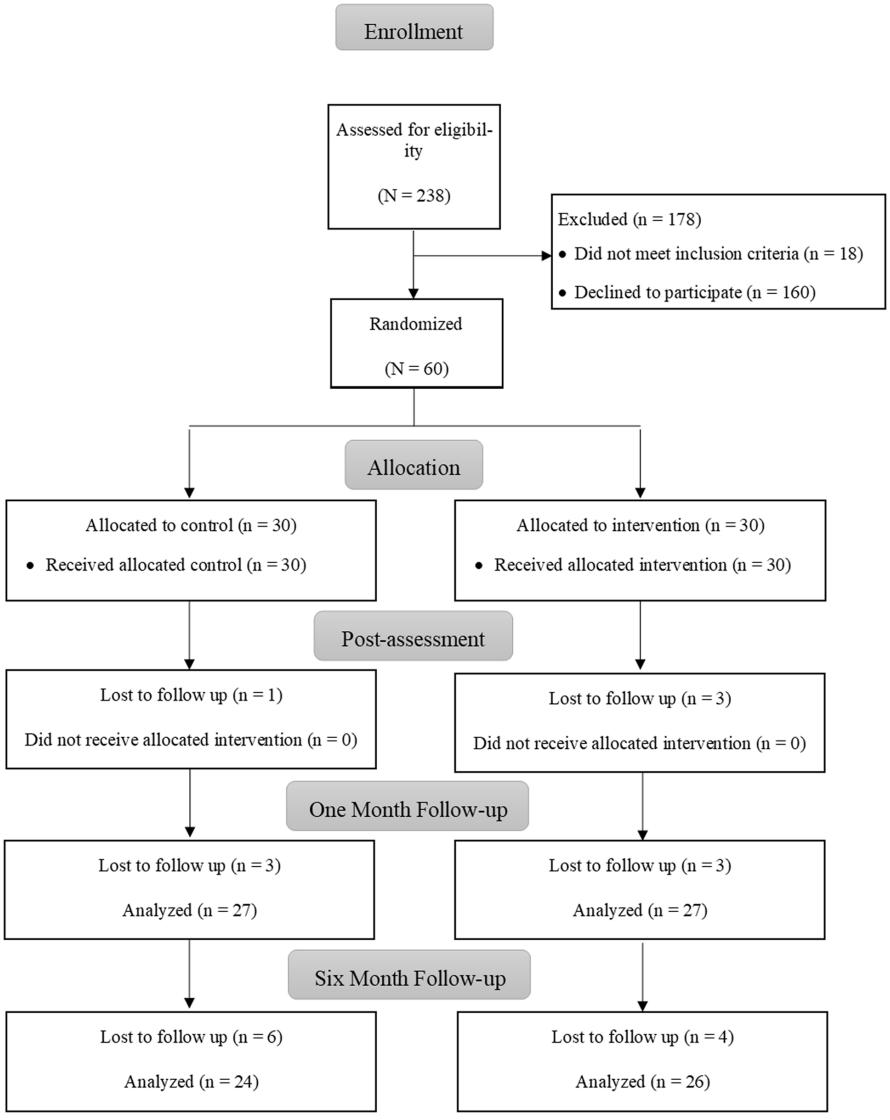

FIGURE 1 CONSORT diagram of participants in the study

TABLE 1 Demographics of participants completing the follow-ups

	1-month follow-up (*n* = 54)		**6-month follow-up (*n* = 50)**	
Age, years (M ± SD)	63.3 ± 12.5		62.2 ± 12.2	
	%	***n***	%	***n***
Gender				
Female	75.9	41	76.0	38
Male	24.1	13	24.0	12
Race				
Black	88.9	48	90.0	45
White	11.1	6	10.0	5

for pain severity found that there was not a statistically significant difference between the intervention and control groups at the 1-month follow-up ($F = 3.33$, $p = 0.07$, $\eta_p^2 = 0.06$), but did find significant group differences at the 6-month follow-up ($F = 8.18$, $p = 0.01$, $\eta_p^2 = 0.15$). There were similar findings for pain catastrophizing. At 1-month, there was not a significant difference between the intervention and control groups ($F = 0.24$, $p = 0.63$, $\eta_p^2 = 01$), but there was a significant difference at the 6-month follow-up ($F = 6.47$, $p = 0.02$, $\eta_p^2 = 0.13$).

TABLE 2 Repeated measures ANOVAs for the intervention and control groups across the study

	Intervention			Control					
	Pre *M (SD)*	1-month *M (SD)*	6-month *M (SD)*	Pre *M (SD)*	1-month *M (SD)*	6-month *M (SD)*	*F*	*p*	η_p^2
Pain severity	6.67 (1.63)	5.17 (2.24)	4.54 (2.62)	6.13 (2.42)	5.52 (3.15)	6.04 (2.05)	5.11	0.01	0.10
Pain interference	4.65 (2.24)	3.76 (2.25)	3.70 (2.35)	4.59 (2.91)	3.65 (2.50)	4.90 (2.82)	2.82	0.07	0.06
Pain catastrophizing	22.37 (11.77)	20.91 (14.44)	17.78 (11.77)	16.90 (14.17)	17.45 (12.54)	22.90 (14.18)	7.07	0.003	0.15
Depression	4.96 (2.79)	4.08 (3.89)	4.54 (3.38)	4.35 (3.90)	4.87 (4.13)	5.74 (4.50)	2.15	0.12	0.05

In determining clinically significant improvement at the 1-month follow-up, among those in the intervention, 33.3% (n = 9), 40.7% (n = 11), 33.3% (n = 9), and 37.0% (n = 10) reported clinically significant reductions in pain severity, pain interference, pain catastrophizing, and depression, respectively. Among those in the control group, 22.2% (n = 6), 25.9% (n = 7), 11.1% (n = 3), and 22.2% (n = 6) reported clinically significant reductions in pain severity, pain interference, pain catastrophizing, and depression, respectively.

At the 6-month follow-up, among those in the intervention, 46.1% (n = 12), 38.5% (n = 10), 34.6% (n = 9), and 42.3% (n = 11) reported clinically significant reductions from baseline for pain severity, pain interference, pain catastrophizing, and depression, respectively. Among those in the control group, 20.8% (n = 5), 12.5% (n = 3), 8.3% (n = 2), 12.5% (n = 3) reported clinically significant reductions in pain severity, pain interference, pain catastrophizing, and depression, respectively.

DISCUSSION

The aim of this study was to examine longer-term outcomes after completion of a brief psychological intervention for chronic pain delivered in a primary care setting. Findings from this study suggested that there may be longer-term effects for pain severity and pain catastrophizing; however, it appears that this was only different at the 6-month follow-up. Although there were no differences for pain interference or depression between the intervention and control groups, a higher number of patients in the intervention group experienced clinically significant improvement in pain severity, pain interference, pain catastrophizing, and depression compared with the control group at the 1-month and 6-month follow-ups. The majority of patients who experienced clinically meaningful changes in pain severity and pain interference from pre- to post-intervention maintained these clinically significant improvements at the 1-month follow-up (40.7% vs. 33.3% and 50% vs. 40.7%, respectively) and 6-month follow-up (46.1% and 38.5%, respectively).[28] These findings suggest that patients who engage in the 5-session psychological intervention not only experience immediate benefits, but also may experience longer-term effects after the intervention has concluded. Additional research with a larger sample would be needed to support this.

Among those in the intervention group, even when variables did not statistically improve from pre-intervention to the follow-ups, scores trended in the direction of improvement. On the contrary, pain catastrophizing and depression worsened for the participants in the control group at the follow-ups, and the magnitude of change for both measures was larger for the intervention group compared with the control group. Individuals with chronic pain often report fluctuations in the pain experience over time.[38] Additionally, some of the follow-up data was collected during the COVID-19 pandemic, which could have worsened patients' reports of their symptoms due to stresses of the pandemic.[39,40] It is possible that not only does this brief intervention improve symptoms for participants post-intervention,[28] but then also protects individuals from experiencing worsening symptoms, especially during periods of stress. This may also explain why there were no group differences at 1 month, but group differences at 6 months. Given our small sample in this pilot, we were likely not powered to find significant group differences at the 1-month follow-up due to lack of power. However, there were group differences at the 6-month follow-up. A significant number of participants completed their 6-month follow-up after the COVID-19 pandemic started, whereas nearly all participants completed the 1-month follow-up prior to the start of the pandemic. Those who participated in the intervention may have been able to use the strategies taught during the pandemic to manage distress during this time.

Findings from the current study were similar to prior research on psychological treatments for pain. A Cochrane review found that among those in CBT for chronic pain, small benefits for pain, disability, and distress were maintained at follow-up.[41] A meta-analysis on mindfulness interventions for chronic pain suggested that although a mindfulness intervention may provide short-term benefits, they may not have long-term effects.[42] For ACT treatments, a meta-analysis found that up to 6 months following an intervention, effect sizes for depression and pain interference were moderate and large, respectively.[10]

Thus, the brief intervention in the current study may offer similar longer-term benefits as prior lengthier interventions. However, it is important to note that a brief intervention may encourage treatment initiation and treatment adherence. Further, offering this intervention in primary care may also engage patients who may not otherwise seek behavioral health services, as this has been true for offering general mental health services in primary care.[24] Future research could examine mechanisms of the intervention. For example, it is possible that increases in mindfulness and acceptance of pain (a focus of this intervention) led to the improvements in the outcomes. Indeed, other mindfulness and acceptance-based interventions for chronic pain management have found that these types of interventions to improve pain severity, pain interference, and depression.[10]

Although this intervention shows promise for longer-term effects, one limitation was the small sample size. The purpose of this study was to pilot and examine the direction of effects; thus, it is important to carry out this study with a larger sample size. Though it is expected that randomizing participants would balance the intervention and control groups on potential confounding variables, due to the small sample size, it is possible that the groups may have differed on factors not assessed during the pilot (i.e., concurrent treatments). Second, the sample was mostly female and Black, and although this was representative of those with chronic pain in the primary care clinic where this study was conducted, this could limit generalizability. However, there has been limited literature on the effects of psychological interventions for pain among racial minorities, and these findings suggest that a brief intervention can have long-term effects for Black patients.

Overall, the brief psychological intervention for chronic pain delivered in primary care showed promising results of having long-term effects for pain severity, pain interference, pain catastrophizing, and depression after the intervention concluded. A brief psychological intervention for chronic pain may offer similar benefits as longer interventions. Future research should examine the long-term effects of delivering a similar intervention in a fully powered trial.

CONFLICT OF INTEREST

There are no conflicts of interest to disclose.

DATA AVAILABILITY STATEMENT

Individuals interested in data can contact the corresponding author.

ORCID

Lisa R. Miller-Matero https://orcid.org/0000-0002-7044-7831

REFERENCES

1. Dahlhamer J, Lucas J, Zelaya C, et al. Prevalence of chronic pain and high-impact chronic pain among adults—United States, 2016. Morb Mortal Wkly Rep. 2018;67(36):1001–6.
2. Miller LR, Cano A. Comorbid chronic pain and depression: who is at risk? J Pain. 2009;10(6):619–27.
3. Bair MJ, Wu J, Damush TM, Sutherland JM, Kroenke K. Association of depression and anxiety alone and in combination with chronic musculoskeletal pain in primary care patients. Psychosom Med. 2008;70(8):890–7.
4. McWilliams LA, Cox BJ, Enns MW. Mood and anxiety disorders associated with chronic pain: an examination in a nationally representative sample. Pain. 2003;106(1–2):127–33.
5. Roditi D, Robinson ME. The role of psychological interventions in the management of patients with chronic pain. Psychol Res Behav Manag. 2011;4:41.
6. Kaiser RS, Mooreville M, Kannan K. Psychological interventions for the management of chronic pain: a review of current evidence. Curr Pain Headache Rep. 2015;19(9):1–8.
7. Ehde DM, Dillworth TM, Turner JA. Cognitive-behavioral therapy for individuals with chronic pain: efficacy, innovations, and directions for research. Am Psychol. 2014;69(2):153–66.
8. Creswell JD. Mindfulness interventions. Annu Rev Psychol. 2017;68:491–516.
9. Hughes LS, Clark J, Colclough JA, Dale E, McMillan D. Acceptance and commitment therapy (ACT) for chronic pain. Clin J Pain. 2017;33(6):552–68.
10. Veehof MM, Trompetter H, Bohlmeijer ET, Schreurs KMG. Acceptance-and mindfulness-based interventions for the treatment of chronic pain: a meta-analytic review. Cogn Behav Ther. 2016;45(1):5–31.
11. Knoerl R, Lavoie Smith EM, Weisberg J. Chronic pain and cognitive behavioral therapy: an integrative review. West J Nurs Res. 2016;38(5):596–628.
12. Thorsell J, Finnes A, Dahl J, Lundgren T, Gybrant M, Gordh T, et al. A comparative study of 2 manual-based self-help interventions, acceptance and commitment therapy and applied relaxation, for persons with chronic pain. Clin J Pain. 2011;27(8):716–23.
13. Cassidy EL, Atherton RJ, Robertson N, Walsh DA, Gillett R. Mindfulness, functioning and catastrophizing after multidisciplinary pain management for chronic low back pain. Pain. 2012;153(3):644–50.
14. Vowles KE, Wetherell JL, Sorrell JT. Targeting acceptance, mindfulness, and values-based action in chronic pain: findings of two preliminary trials of an outpatient group-based intervention. Cogn Behav Pract. 2009;16:49–58.
15. Becker WC, Dorflinger L, Edmond SN, Islam L, Heapy AA, Fraenkel L. Barriers and facilitators to use of non-pharmacological treatments in chronic pain. BMC Fam Pract. 2017;18(1):41.
16. De Ruddere L, Craig KD. Understanding stigma and chronic pain: a-state-of-the-art review. Pain. 2016;157(8):1607–10.
17. Garland EL, Manusov EG, Froeliger B, Kelly A, Williams JM, Howard MO. Mindfulness-oriented recovery enhancement for chronic pain and prescription opioid misuse: results from an early-stage randomized controlled trial. J Consult Clin Psychol. 2014;82(3):448–59.
18. Barry DT, Beitel M, Cutter CJ, Fiellin DA, Kerns RD, Moore BA, et al. An evaluation of the feasibility, acceptability, and preliminary efficacy of cognitive-behavioral therapy for opioid use disorder and chronic pain. Drug Alcohol Depend. 2019;194:460–7.
19. Nicholas MK, Asghari A, Blyth FM, Wood BM, Murray R, McCabe R, et al. Long-term outcomes from training in self-management of chronic pain in an elderly population: a randomized controlled trial. Pain. 2016;158(1):86–95.

20. Schappert SM. National Ambulatory Medical Care Survey: 1989 summary. Vital Health Stat 13. 1992;110:1–80.
21. Mantyselka P, Kumpusalo E, Ahonen R, et al. Pain as a reason to visit the doctor: a study in Finnish primary health care. Pain. 2001;89(2–3):175–80.
22. Martin MP, White MB, Hodgson JL, Lamson AL, Irons TG. Integrated primary care: a systematic review of program characteristics. Fam Syst Health. 2014;32(1):101–15.
23. Vogel M, Malcore S, Illes R, Kirkpatrick H. Integrated primary care: why you should care and how to get started. J Ment Health Couns. 2014;36(2):130–44.
24. Miller-Matero LR, Dubaybo F, Ziadni MS, Feit R, Kvamme R, Eshelman A, et al. Embedding a psychologist into primary care increases access to behavioral health services. J Prim Care Community Health. 2015;6(2):100–4.
25. Bortolotti B, Menchetti M, Bellini F, Montaguti MB, Berardi D. Psychological interventions for major depression in primary care: a meta-analytic review of randomized controlled trials. Gen Hosp Psychiatry. 2008;30(4):293–302.
26. Butler M, Kane RL, McAlpine D, Kathol R, Fu SS, Hagedorn H, et al. Does integrated care improve treatment for depression? A systematic review. J Ambul Care Manage. 2011;34(2):113–25.
27. Khoo E-L, Small R, Cheng W, Hatchard T, Glynn B, Rice DB, et al. Comparative evaluation of group-based mindfulness-based stress reduction and cognitive behavioural therapy for the treatment and management of chronic pain: a systematic review and network meta-analysis. Evid Based Ment Health. 2019;22(1):26–35.
28. Miller-Matero LR, Hecht L, Miller MK, et al. A brief psychological intervention for chronic pain in primary care: a pilot randomized controlled trial. Pain Med. 2021;22:1603–11.
29. McCracken LM, Turk DC. Behavioral and cognitive-behavioral treatment for chronic pain: outcome, predictors of outcome, and treatment process. Spine. 2002;27(22):2564–73.
30. Veehof MM, Trompetter HR, Bohlmeijer ET, Schreurs KM. Acceptance- and mindfulness-based interventions for the treatment of chronic pain: a meta-analytic review. Cogn Behav Ther. 2016;45(1):5–31.
31. Nasreddine ZS, Phillips NA, Bédirian V, et al. The Montreal cognitive assessment, MoCA: a brief screening tool for mild cognitive impairment. J Am Geriatr Soc. 2005;53(4):695–9.
32. Cleeland CS. Measurement of pain by subjective report. In: Loeser CRCJD, editor. Issues in pain measurement. Advances in pain research and therapy. New York: Raven Press; 1989.
33. Dworkin RH, Turk DC, Wyrwich KW, Beaton D, Cleeland CS, Farrar JT, et al. Interpreting the clinical importance of treatment outcomes in chronic pain clinical trials: IMMPACT recommendations. J Pain. 2008;9(2):105–21.
34. Farrar JT, Young JP Jr, LaMoreaux L, Werth JL, Poole RM. Clinical importance of changes in chronic pain intensity measured on an 11-point numerical pain rating scale. Pain. 2001;94(2):149–58.
35. Sullivan MJ, Bishop SR, Pivik J. The pain catastrophizing scale: development and validation. Psychol Assess. 1995;7(4):524–32.
36. Osman A, Barrios FX, Gutierrez PM, Kopper BA, Merrifield T, Grittmann L. The pain catastrophizing scale: further psychometric evaluation with adult samples. J Behav Med. 2000;23(4):351–65.
37. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta Psychiatr Scand. 1983;67(6):361–70.
38. Glette M, Stiles TC, Borchgrevink PC, Landmark T. The natural course of chronic pain in a general population: stability and change in an eight–wave longitudinal study over four years (the HUNT pain study). J Pain. 2020;21(5–6):689–99.
39. Fallon N, Brown C, Twiddy H, et al. Adverse effects of COVID-19-related lockdown on pain, physical activity and psychological well-being in people with chronic pain. Br J Pain. 2020;15:357–68.
40. Mun CJ, Campbell CM, McGill LS, Aaron RV. The early impact of COVID-19 on chronic pain: a cross-sectional investigation of a large online sample of individuals with chronic pain in the United States, April to May, 2020. Pain Med. 2021;22(2):470–80.
41. ACC W, Fisher E, Hearn L, Eccleston C. Psychological therapies for the management of chronic pain (excluding headache) in adults. Cochrane Database Syst Rev. 2020;8:CD007407.
42. Anheyer D, Haller H, Barth J, Lauche R, Dobos G, Cramer H. Mindfulness-based stress reduction for treating low back pain: a systematic review and meta-analysis. Ann Intern Med. 2017;166(11):799–807.

How to cite this article: Miller-Matero L, Gavrilova L, Hecht L A brief psychological intervention for chronic pain in primary care: Examining long-term effects from a pilot randomized clinical trial. Pain Pract. 2022;22:564–570. https://doi.org/10.1111/papr.13134