PSYCHOLOGY, PSYCHIATRY, & BRAIN NEUROSCIENCE SECTION

Dialectical Pain Management: Feasibility of a Hybrid Third-Wave Cognitive Behavioral Therapy Approach for Adults Receiving Opioids for Chronic Pain

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Abstract

Objectives. This study evaluated the feasibility, acceptability, and potential effectiveness of a hybrid skills-based group intervention, dialectical pain management (DPM), for adults with chronic pain who are receiving long-term opioid therapy. DPM adapts dialectical behavior therapy, a rigorous psychotherapeutic approach to emotion dysregulation, to treat disorders of physiological dysregulation. **Methods.** Individuals with chronic pain (N = 17) participated in one of two 8-week DPM intervention cohorts. At pre-test and post-test, participants completed quantitative self-report assessments measuring pain intensity and interference, depressive symptoms, pain acceptance, beliefs about pain medications, and global rating of change. Within 2 weeks after the intervention, participants completed qualitative interviews to assess participant satisfaction and obtain feedback about specific intervention components. **Results.** Of the 17 enrolled, 15 participants completed the group with 12 (70%) attending six or more sessions. Participants reported high satisfaction with the intervention. Preliminary findings suggested a significant increase in pain acceptance and a significant reduction in depressive symptoms. Participants also reported an improved relationship with their pain conditions and increased flexibility in responding to pain and applying coping skills. Several participants showed a reduction in opioid dosage over the course of the intervention. **Discussion.** Findings support that DPM is a feasible and well-received intervention for individuals with chronic pain. Additional research with a control group is needed to further determine the intervention's efficacy and impact.

Key Words: Acceptance and Commitment Therapy (ACT); Chronic Pain; Cognitive Behavioral Therapy (CBT); Dialectical Behavior Therapy (DBT); Dialectical Pain Management (DPM); Opioid

Introduction

Chronic pain is common, and its societal and clinical burden is high [1, 2]. A recent Institute of Medicine report estimated that up to one third of Americans suffer from chronic noncancer pain [3]. Chronic pain can affect all aspects of an individual's life, including work, school, caregiving roles, and relationships, and is often comorbid with mental health and substance use disorders [4–9].

Chronic noncancer pain costs the United States up to \$635 billion annually in direct medical costs, lost productivity, and disability programs, more than the cost for cancer, diabetes, or heart disease [10]. Complete resolution of chronic pain symptoms is uncommon.

There has been a reliance on pharmacological approaches, generally opioids, to treat pain in both primary care and specialty pain clinics. Approximately 10

million Americans are on long-term opioid therapy for chronic nonmalignant pain [11]. This approach has come under scrutiny in recent years, with attention to abuse risks, rising overdose deaths, and growing evidence of the ineffectiveness of opioids for chronic pain management and the risks of opioid-induced hyperalgesia [12, 13]. Heightened “opioid pharmacovigilance” [14] has led to a decrease in opioid prescribing [15] and has spurred interest in psychotherapeutic approaches to address the suffering of the millions in pain [16–19].

Chronic pain is now understood as a biopsychosocial disorder, with a complex interplay among psychological, social, contextual, and biological factors that reciprocally contribute to pain intensity and disability [20]. From this perspective, effective treatment of persistent pain requires integrated psychological, behavioral, and biological approaches [21].

Cognitive behavioral therapy (CBT) has been the primary psychotherapeutic approach to chronic pain for more than three decades and enjoys the strongest evidence base [22]. Traditional CBT for chronic pain (CBT-CP) emphasizes skills to help people change thoughts and behaviors in order to reduce pain and improve functioning. Such skills include relaxation, activity pacing, sleep hygiene, scheduling pleasant activities, and the identification and modification of cognitive distortions [18, 23, 24].

More recently, “third-wave” CBT approaches [25], incorporating mindfulness and acceptance strategies, have also shown some effectiveness for treating chronic pain, depression, and substance use disorders [26]. The most widely tested of these approaches, acceptance and commitment therapy (ACT), emphasizes the pursuit of valued activity even in the face of unwanted thoughts, feelings, and bodily sensations such as pain, rather than symptom reduction [27–29]. Both CBT and ACT as well as other mindfulness-based interventions, have been shown to offer small to moderate benefits for people with chronic pain [30–32].

The contrast between CBT and ACT approaches mirrors debates in the broader field of pain management: whether to improve functionality by reducing symptom intensity and shoring up coping skills [33] or improve functionality regardless of symptom intensity [34]. CBT focuses primarily on managing and coping with pain, whereas ACT focuses on accepting one’s symptoms and living life regardless of pain [35].

We hypothesize that people with chronic pain will benefit from a combination of these two seemingly contradictory approaches. This synthesis is at the heart of dialectical behavior therapy (DBT) [36], another “third-wave” approach, which treats change and acceptance as a permanent dialectic, simultaneously encouraging radical or wholehearted acceptance of present moment reality as it is (as in ACT) while also taking steps to decrease symptoms and their effects (as in CBT).

Originally developed by Linehan [36] for chronically suicidal adults, DBT has become the standard treatment for borderline personality disorder (BPD), which is characterized by pervasive emotional dysregulation, unstable self-image, impulsivity, interpersonal chaos, and recurrent suicidal behavior, threats, or self-injurious behavior. Linehan adopted a dialectical approach because this population found behavioral change on its own to be invalidating and acceptance on its own to be dismissive of the depth of suffering [37]. In response, DBT offered a dynamic synthesis of validation/acceptance and change strategies that helps people who are overwhelmed by emotional distress to accept their reality while simultaneously building skills to change their experience.

The risk of invalidation seems similarly relevant with chronic pain because of the invisible, subjective, and variable nature of its symptoms. People with chronic pain often report feeling disbelieved or having their experience disparaged or dismissed as “all in their head” [35, 38]. Invalidation has been linked to worse treatment outcomes and to disability [38, 39]. Conversely, validation itself may increase functioning and reduce pain intensity [40]. In a recent study, the combination of ACT and CBT reduced invalidation among people with chronic pain more than either approach on its own [35], suggesting the value of a dialectical framework.

Linehan herself noted parallels between the experience of chronic pain—a disorder of pervasive physiological dysregulation [41]—and the experience of emotional dysregulation: “My guess is that if we withheld pain medication from [people in intense pain], they would vacillate in exactly the same manner as borderline individuals” (Linehan, 1993, p.18) [36]. Chronic pain is commonly associated with all/nothing or nondialectical cognitions and behavior, such as catastrophizing, activity avoidance, and pushing through pain and then collapsing in despair [42, 43]. Pain-induced emotional distress is common [44, 45]. In addition, people with chronic pain experience disruptions in life quality that parallel those experienced by people with emotional dysregulation; these disruptions are profound when physical and psychological vulnerabilities intensify each other [46, 47]. The prevalence of chronic pain is high among those with BPD, as well as those with depression, posttraumatic stress disorder (PTSD), substance use disorders, and other mental health conditions [48–50], and research suggests similar interoceptive dysregulation and neural mechanisms in chronic pain and psychiatric disorders [51–55]. Thus treating chronic distress—whether physical, emotional, or a combination—might benefit from a dialectical approach.

This approach may be particularly applicable to individuals with chronic pain who receive opioid therapy for pain management and who are now facing stigma and pressure to reduce their reliance on this medication. The interrelationships among opioids, emotions, and physical pain are complex, making reduction difficult [56–59].

Chronic pain and depression are both associated with decreased availability of opioid receptors that modulate pain, mood, and stress levels [57], yet people on higher doses of opioids have been found to suffer greater depression and psychosocial problems [60]. Opioid medication, while modulating distress, also dampens naturally occurring opioids (e.g., endorphins) and can cause opioid-induced hyperalgesia [61]. Moreover, emotion dysregulation and distress intolerance both increase the risk of opioid misuse and are more predictive of poorer outcomes than is pain intensity or duration [62–66]. These all highlight the need for interventions that target distress tolerance and emotion regulation in the context of pain.

DBT is well established as a transdiagnostic approach beyond treating BPD, with evidence-based application to multiple and severe psychosocial disorders, including substance use, PTSD, and mood and eating disorders [67, 68]. The evaluation of DBT for chronic pain is in its nascent stages. However, there is evidence that each of the four areas that comprise the DBT skills modules—mindfulness [69, 70], emotion regulation [71], interpersonal effectiveness [72], and distress tolerance [62, 65]—are linked to life quality for people with chronic pain and can help treat opioid use and suicidality in this population.

Moreover, the studies that have adapted DBT for patients with chronic pain report decreases in pain intensity, catastrophizing, fear, insomnia, and depressive symptoms, along with increases in acceptance of pain [73–76]. These promising findings are based, thus far, on a case study of individual DBT [73]; a 12-week DBT skills group targeting the psychological and emotional aspects of chronic pain [75]; and the application of a DBT hybrid that uses emotion regulation and exposure (fear avoidance), first in a small feasibility trial [74] and then in a randomized comparison with CBT for people with chronic pain with co-occurring emotional problems [76].

The clinical experience of the primary author (DB) of the present study also suggests that people with chronic pain would benefit from a version of DBT that is tailored specifically for this population. In addition, during more than 10 years co-facilitating DBT groups, the author observed that participants with comorbid chronic pain did not intuitively translate DBT skills to their experience with pain, which often manifested in missed sessions and difficulty sitting through group sessions. Without explicit reference to chronic pain, traditional DBT may underengage with this core piece of this population's experience. DBT's origin in treating emotion dysregulation, though relevant, might also seem invalidating to those who present with physical pain and whose symptoms and struggles are often dismissed as psychogenic [38, 39].

The present study tests a group psychotherapeutic intervention named dialectical pain management (DPM) to emphasize its explicit focus on physical pain. DPM draws heavily from DBT, applying its dialectical approach to

synthesize elements of CBT for managing symptoms with ACT's focus on functioning despite symptoms.

DPM is delivered much like a DBT skills class, adapting specific DBT skills and integrating skills from ACT and CBT to the dialectical challenges of living with chronic pain. The modularity of DBT encourages deviation from its full model [77], and its skills group component has been shown to be effective on its own [78]. Studies of ACT for chronic pain [28] and CBT-CP [79, 80] delivered in a close-ended group format suggest they are as effective as the more often tested individual delivery. Moreover, people with chronic pain often feel isolated and invalidated; group-based treatment can help people feel more understood, more connected, and less alone in their suffering [81–83].

The purpose of the present study was to evaluate the feasibility and acceptability of a dialectical group approach to chronic pain management and measure its potential effects on pain severity, depression, and functioning and pain acceptance for adults receiving long-term opioid therapy for chronic pain. Although reducing reliance on opioids was not an explicit goal or focus of the intervention, we collected data on use of opioid medication and attitudes about medication to see if skill development might affect individuals' reliance on opioid therapy.

Methods

Study Design and Participants

This was a single-site, single-arm feasibility trial, assessed by enrollment, attendance, attrition, and intervention satisfaction, with quantitative assessments conducted before and after the intervention and qualitative interviews conducted after the intervention. The University of North Carolina (UNC) at Chapel Hill Institutional Review Board approved all study procedures. Participants provided written informed consent after reviewing the documents with study personnel.

Participants were English-speaking adults (≥ 19 years of age) with chronic pain (pain on most days for at least 90 days) who were taking daily opioid pain medications equaling 30 mg or more of morphine equivalent dose for at least 3 months. Individuals were excluded from the study if they were currently pregnant, had active suicidal ideation or self-injurious potential necessitating immediate treatment, or had any conditions (e.g., marked cognitive impairment, tendencies towards physical aggression) that would impede participation in a group intervention, as assessed by the evaluating clinician. People were not excluded for mental health comorbidities, passive suicidal ideation, or current or prior involvement in psychotherapy, regardless of the type. Participants were recruited from UNC Hospital and other hospitals or clinics in the surrounding area through provider referrals,

posted flyers, and e-mail posts on professional electronic mailing lists of area psychotherapists.

Procedures

The intervention therapist contacted interested individuals to conduct a brief phone screening to confirm study eligibility. Eligible participants then met individually with study personnel for a 30-minute baseline assessment, during which they completed informed consent procedures and self-report questionnaires, received an orientation about the DPM group intervention, and could ask any questions. Study personnel informed participants that research notes would be uploaded to their electronic medical records documenting their participation and the content of each intervention session, but these records would not include data from questionnaires. Immediately after completing the questionnaires, participants met with the group therapist, who conducted a 60-minute intake interview to determine any relevant biopsychosocial history, such as trauma history, alcohol and substance use, emotional difficulties, interpersonal violence, suicidal ideation or self-harm behaviors, and experience with therapy, in addition to the participant's treatment goals. The therapist also provided information about what to expect during the intervention.

After the assessment, participants were scheduled to attend one of two 8-week DPM groups, depending on participants' availability. After the final session, participants completed quantitative self-report questionnaires. Within 2 weeks after the final session, participants completed a 15- to 30-minute, semi-structured, qualitative phone interview with study personnel to learn about participants' experiences with the intervention (e.g., benefits and challenges), suggestions to improve the intervention, and any changes to their opioid medications since baseline. There were no further follow-up assessments. Participants received a \$20 Starbucks gift card each time they completed questionnaires (up to two) and hospital parking vouchers at the assessment and intervention visits. The intervention was provided free of charge, with no additional incentive for attending sessions.

DPM Skills Group

DPM is a group skills-based intervention including eight weekly group sessions (1 hour and 45 minutes each) with six to nine participants in each group. Sessions were conducted at UNC Hospitals and were led by the primary author (DB), a licensed clinical social worker who developed the study intervention and previously delivered it to adults with chronic pain within her clinical practice at UNC.

From the outset, DPM is presented as a dialectical integration of CBT and ACT for pain. During the individual orientation and first group session, participants are introduced to DPM's approach to pain that integrates

change (i.e., ways to close one's "pain gate") with acceptance of the present moment as it is. The pain gate, a core construct in CBT-CP, is extended dialectically, with practices to close the gate and practices to observe its fluctuations without reactivity. Dialectics is also emphasized as a skill of its own. Participants learn to identify "nondialectical" thinking and its effects and to cultivate their ability to view situations from multiple and seemingly contradictory perspectives, increasing their ability to embrace both change and acceptance.

This dialectical framework is then elaborated and deepened through mindfulness and acceptance practices that address both the pain gate and life engagement. Week 2 teaches nonjudgmental awareness practices to observe the gate with curiosity and one-mindful participation practices to engage more fully in valued activities, which may (and may not) close the gate. Week 3 focuses on values clarification, values-based actions, and radical acceptance of what is out of one's control. Participants are guided to identify the kind of person they want to be and how they would choose to "spend their pain."

Subsequent weeks apply this core framework to common struggles for people with chronic pain, with skills to address each. These areas—emotions, vulnerability, self-compassion, motivation, invalidation, and interpersonal effectiveness—were identified through literature and corroborated by members' goal lists and feedback from several years of earlier iterations of DPM groups. A summary of weekly content and home practice topics is provided in [Table 1](#). The group leader also modeled the acceptance-change dialectic throughout, with expectations that people participate fully while also accepting people's choices and offering pain-gate closers (e.g., homemade heat/cold packs, footrests, and options to sit, lie down, or move during class).

Each group session began with a mindfulness exercise that corresponded with the material being covered (e.g., mindfulness of the breath, nonjudgment of body sensations, observing thoughts, fostering pleasant experiences). Homework was then reviewed (with the exception of the first session), with participants describing their weekly skills practice, what went well, and any challenges that arose. The group therapist reinforced participants' skill use while validating their valid experiences. Then the group therapist introduced additional psychoeducational content, building on the core framework and skills from past sessions. Content was presented in an interactive format. The therapist provided explanation and examples, often asking questions and soliciting examples from group members and conducting brief experiential exercises to facilitate learning. Participants received visual and written aids in weekly handouts summarizing the material, as well as in home practice worksheets. The group therapist explained the home practice for the week, either describing an example of how to complete the homework or soliciting participants to walk through the homework steps briefly in session. Most sessions

Table 1. Summary of DPM skills group sessions

Session	Title	Content
1	Introducing core framework of “dialectic” applied to accepting and changing pain	<ul style="list-style-type: none"> • Introduce CBT content on the “pain gate”—practicing with awareness of opening/closing of gate and practices to close pain gate • Introduce ACT content—identifying life values and moving toward these (where to “spend pain”) • Dialectical approach (both/and) that synthesizes ACT and CBT, and its application to improving life with chronic pain
2	Core mindfulness skills applied to chronic pain	<ul style="list-style-type: none"> • Introduce mindfulness as a way to experiment with pain-gate closing practices (DBT/CBT) and attend to objective of choice (DBT/ACT) • One-mindful participation in valued activity (DBT/ACT) (while observing pain gate, which may or may not close) • Nonjudgmental approach to internal and external experience (including nonjudgment of “sensation” rather than “pain”) (DBT/ACT)
3	Values, radical acceptance, and committed action	<ul style="list-style-type: none"> • Introduce radical acceptance and willingness, applied to living with pain and beyond (DBT) • Identify values and steps to orient toward values (ACT) (decision about how to “spend your pain?”)
4	Mindful Self-Compassion	<ul style="list-style-type: none"> • Separate fact from “story” (DBT/CBT/ACT) • Modulating self-talk with kindness (DBT/CBT) • Engage in self-soothing behaviors to close pain gate (DBT/CBT)
5	Pain and emotions	<ul style="list-style-type: none"> • What is an emotion? What is sensation? Overlap of sensation and emotion, under broader concept of distress (based on work by Lisa Feldman Barrett)* • Experiencing emotions as “waves” and effect on pain gate to change self-talk, physiology, arousal (DBT/CBT) • Generating and savoring positive emotions and effect on pain gate (DBT/CBT)
6	Reducing vulnerabilities through balance	<ul style="list-style-type: none"> • Self-care skills (e.g., pacing, exercise, sleep) and their relationship with pain-gate (CBT/DBT) • Motivation skills that involve validation and opposite action (DBT)
7	Interpersonal effectiveness skills	<ul style="list-style-type: none"> • Validating oneself and others and the effects of validation on pain gate (CBT/DBT) • Steps to recover from invalidation (DBT) • Asking for what you want, even when others don’t “get it” (DBT/ACT)
8	Planning and coping ahead (with skills review)	<ul style="list-style-type: none"> • Being effective with “what is” (DBT/ACT) • Incorporating what works and coping ahead calmly and effectively (DBT/ACT/CBT)

*Barrett, L.F. *How Emotions Are Made: The Secret Life of the Brain*. Houghton Mifflin Harcourt, 2017.

included two to three homework exercises so that participants had multiple options for practicing the skills each week, but they were not required to complete all exercises, emphasizing group members’ choice and agency. Every session ended with participants stating briefly what they were planning to practice that week and providing a closing remark about one thing they observed in the moment or learned that session.

Measures

At the baseline visit, participants were asked about demographic information (age, gender, race/ethnicity, highest level of education), pain condition (primary sources of pain and the most challenging area of pain, if more than one source), and opioid medications (names, dose, and frequency). Participants’ disclosures during intake interviews about their mental health, substance use, and experience with therapy were not systematically collected on instruments by the research staff. A record of session attendance was kept for each participant. Unless otherwise stated, the following measures were administered at baseline and after treatment.

Pain Intensity and Interference

The Brief Pain Inventory (BPI) [84] pain severity and pain interference subscales were administered. Pain severity consists of four items, including pain intensity at its worst in the last week, at its best in the last week, on average, and right now, on a scale from 0 (no pain) to 10 (pain as bad as you can imagine). Pain interference consists of seven items asking respondents to describe how much in the last week pain has interfered with general activity, mood, walking ability, normal work, relations with other people, sleep, and enjoyment of life. Items are on a scale from 0 (does not interfere) to 10 (completely interferes). To score, the average of each subscale is calculated. The BPI has shown adequate psychometric properties in samples with chronic nonmalignant pain, including adequate internal consistency (coefficient alphas ≥ 0.80), construct validity, convergent and discriminant validity, and responsivity to change as a result of treatment [85, 86]. A 20% drop on the BPI pain severity and pain interference subscales could be considered a minimal clinically important difference [87].

Depression Severity

The Patient Health Questionnaire-9 (PHQ-9) [88] is a nine-item inventory measuring severity of depression over the past 2 weeks. The items came directly from the *Diagnostic and Statistical Manual (DSM)-IV* criteria for major depressive disorder (and align with DSM-5). Responses include 0 = not at all, 1 = several days, 2 = more than half the days, and 3 = nearly every day. To score, the items are summed, and total scores fall within one of the following levels of depression severity: minimal (0–4), mild [5–9], moderate [10–14], moderately severe [15–19], and severe [20–27]. The PHQ-9 is a standardized measure, has been shown to be sensitive to change over time, and has demonstrated good criterion validity, construct validity, and external validity compared with other established measures [88]. A clinically significant change on the PHQ-9 is often defined as an absolute decrease of five points or a 50% reduction in symptoms [89].

Chronic Pain Acceptance

The revised Chronic Pain Acceptance Questionnaire (CPAQ) [90] is a 20-item scale assessing two aspects of chronic pain acceptance: activity engagement and pain willingness. The activity engagement factor assesses one's pursuit of life activities regardless of pain, and the pain willingness factor assesses one's recognition that avoidance and control of pain may be unworkable strategies when adapting to chronic pain. Items are rated on a seven-point scale from 0 (never true) to 6 (always true). The items for activity engagement and pain willingness are summed to obtain a score for each factor, and the scores for each factor can be summed to obtain a total score. Higher scores indicate higher levels of acceptance. The revised CPAQ has demonstrated good internal consistency, construct validity, and predictive validity [90].

Beliefs About Pain Medications

The Beliefs about Medicines Questionnaire [91] was administered to assess two five-item subscales (i.e., concern and necessity) indicating participants' concerns about the adverse consequences of taking their pain medications and the perceived positive effect and necessity of pain medications for their health. The items were rated on a five-point scale from 1 (strongly disagree) to 5 (strongly agree). Items were summed to obtain subscale scores, and higher scores indicated greater beliefs. The scale was originally validated in a sample with chronic illnesses [91] and has been used with chronic pain samples [92]. We wrote and added one item to the questionnaire (scored separately) to ascertain participants' agreement with the following statement: "Reducing my reliance on pain medications is a goal of mine."

Global Rating of Change

A retrospective Global Rating of Change instrument was administered at the post-intervention assessment.

Retrospective Global Rating of Change instruments are typically a single item asking participants in an intervention or longitudinal study about the degree of change since baseline [93]. The item asked participants to rate the overall relationship with their pain condition from the time before they took the class until the present, with 15 options ranging from "a very great deal worse" to "a very great deal better."

Qualitative Interview

Participants were asked to complete a 15- to 30-minute semi-structured phone interview within 2 weeks after completing the intervention to assess participant satisfaction with and suggestions for improving the DPM intervention. The interviewer asked: 1) "Did you experience any benefits from participating in these classes?" If yes, they were asked to describe what was most helpful, with general follow-up probes: "anything about" (a) "skills covered," (b) "teaching style," or (c) "group dynamics," and "if there was anything that you are doing differently." Researchers also asked: 2) "Do you have feedback to improve the classes?" If yes, "what would you want to be different?" Follow-up questions asked whether there was anything about the (a) format/schedule, (b) content itself, (c) teaching style, or (d) group dynamic. Interviews were administered by two research team members who did not instruct the groups. The interviews were not audio-recorded, but interviews were transcribed as verbatim as possible as the interview occurred. There may be minor transcription errors.

Analyses

Feasibility and acceptability were evaluated by calculating percentages for intervention session attendance, attrition, and data collection completion. Outcome measure distributions and baseline to post-intervention change scores for each measure were evaluated for normality. Paired *t* tests were conducted for participants who completed both the pre- and post-intervention assessments to evaluate within-subject mean change on each outcome measure (pain severity and interference, depression, chronic pain acceptance, and medication beliefs). Retrospective Global Rating of Change was described in terms of the percentage of participants rating each category. From participants' self-report of their opioid medications and dosages, we also calculated the morphine equivalent dosages at baseline and after the intervention, as well as the percentage of participants reporting post-intervention changes in their opioid medications. We do not regard these quantitative analyses as definitive, but rather, as a theory-driven preliminary investigation of possible mechanisms of action for DPM.

The data from the post-intervention interviews were analyzed line by line from transcripts by using thematic analysis and an inductive approach [94–96]. The process adhered to the six phases of reflexive thematic analysis—

familiarization, initial coding, theme construction, reviewing themes, defining themes, and producing the report [97, 98]. The first two authors (DB, CEB) immersed themselves in the data, reading and re-reading transcripts while searching for patterns and meanings. All substantive text segments were listed in Excel spreadsheets. An open-coding process was used to characterize each segment in the next column. Columns of coded categories were repeatedly sorted, and similar ideas were chunked together and continually reviewed and consolidated until main themes were identified that kept the data's context. These authors then returned to the transcripts to assign each data unit to a theme until satisfactory interrater consensus and thematic saturation were reached [99, 100]. This resulted in seven themes, with key findings reported under each theme and selected verbatim quotes to illustrate each.

With regard to missing data, with the exception of four participants who did not complete the post-intervention assessment, there was only one participant missing one item on the Medication Beliefs Questionnaire at the pre-test assessment. The item value was imputed by taking the average value of the participant's responses on the other items in the scale, so as not to exclude it from the analyses. Of the four people who did not complete follow-up interviews, two participated in fewer than five sessions and two participated in six or more sessions.

Results

Feasibility

Recruitment began 8 weeks before the start of the intervention. Twenty-seven people responded with initial interest. All met inclusion criteria for pain duration (and were not currently pregnant). Twenty-two met the criteria for opioid medication; five were prescribed doses less than 30 mg of morphine equivalency, including two who had recently tapered to below that threshold. Twenty expressed interest in participating after learning what the intervention involved. From these 20, intake interviews were successfully scheduled with 17, who all enrolled. None of these individuals had active suicidal ideation, which would have excluded them from this study.

Two participants (11.8%) out of 17 enrolled withdrew from the study. One participant withdrew after attending one session because of an upcoming surgery. The other participant was lost to follow-up after the baseline assessment visit. Thirteen of the 17 participants (76.5%) completed the post-intervention assessment. Six participants (35.3%) attended all eight sessions, four (23.5%) attended seven sessions, and two (11.8%) attended six sessions, with the remaining five participants attending fewer than five sessions. This is summarized in a flow diagram (see Figure 1).

Figure 1. Flow diagram.

Descriptives

Seventeen adults with chronic pain who were 28 to 75 years of age (mean age=54 years) enrolled in the study. The majority of participants were female and White and had a college degree or greater. Most respondents (82%) reported having more than one source of pain, which included back pain, fibromyalgia, arthritis, neuropathy, complex regional pain syndrome, and pelvic pain. The majority of respondents (59%) were taking two different opioids on a daily basis, with an average total dose of 165.22 mg of morphine equivalents daily. See Table 2 for participant demographics and pain characteristics.

At baseline, participants' average scores on the BPI-Severity subscale (Mean = 5.90, range 3.75 to 8.00) and BPI-Interference subscale (M = 6.30, range 3.00 to 9.43) were in the moderate range out of a possible score of 10. Participants' baseline scores on the CPAQ averaged 49.08 out of a possible score of 120 and ranged from 24 to 97, with higher scores indicating greater pain acceptance. On average, participants reported depressive symptoms of moderate severity on the PHQ-9 (M = 13.23) and ranged from minimal to severe. On average, participants agreed with statements about the perceived positive effect and necessity of pain medications for their health (M = 18.92 out of possible scores of 5 to 25) and were more neutral with regard to concerns about the adverse consequences of taking pain medications (M = 15.69 out of possible scores of 5 to 25). On average, participants agreed that reducing reliance on medication was a goal of theirs (M = 4.23 out of possible scores of 1 to 5).

The clinical intake interviews revealed that the majority of participants had mental health diagnoses, the most

common being anxiety and major depressive disorder, and all reported some depressive symptoms. Other diagnoses included PTSD, bipolar depression, BPD, and substance use disorder. All but two had received prior psychotherapy, including three who specified having experience with DBT, two with CBT, and one with ACT. Information on diagnosis and prior experience with

therapy, collected as part of the standard clinical intake, is not included in the quantitative data analysis.

Preliminary Efficacy

From before to after the intervention, depressive symptoms measured by the PHQ-9 scale reduced significantly (mean Δ =-3.85; 95% confidence interval [CI]: -7.26 to -0.43; P = 0.030). Acceptance also increased significantly, as measured by the CPAQ total scores (mean Δ =15.78; 95% CI: 7.22 to 24.32; P = 0.002) and its subscales Pain Willingness (mean Δ =9.31; 95% CI: 4.50 to 14.12; P = 0.001) and Activity Engagement (mean Δ =6.46; 95% CI: 0.31 to 12.62; P = 0.041). No significant changes were reported in pain severity or interference or on the Medication Beliefs Questionnaire subscales (Necessity, Concern, and one item assessing the goal to reduce pain medications). Three of 13 (23%) had at least a 20% decrease on the BPI-Interference scale; 0 of 13 had a 20% decrease on the BPI-Severity scale. See Table 3 for the results of all paired t tests.

On the Global Rating of Change Scale, 12 of 13 participants reported that their relationship with their pain condition had improved, with three (23.1%) selecting “moderately better,” six (46.2%) “quite a bit better,” two (15.4%) “a great deal better,” and one (7.7%) “a very great deal better.” One participant (7.7%) reported that it was “about the same.” None reported that it had worsened.

With regard to change in opioid medication, five participants (38.5%) reported decreasing their opioid medications since baseline. Of these five, the percent reductions were 17%, 25%, 34%, 55%, and 74% calculated in daily morphine equivalent doses. Two participants reported a daily reduction in morphine milligram equivalent dosages of between 170 and 180 mg. The other three participants reported a reduction in dosage of between 20 mg and 60 mg. Seven participants (53.8%) reported that their opioid medications had not changed since their baseline assessment. One of 13 participants (7.7%) reported slightly increasing opioid medications;

Table 2. Participant demographics and pain characteristics (N = 17)

Variable	N (%) or Mean (M) $\pm$ SD (Range)
Age, years	54 $\pm$ 14.6 (28–75)
Female gender (remaining are male)	12 (70.6)
Race/ethnicity	
White, non-Hispanic	14 (82.4%)
Black or African American	1 (5.9%)
Hispanic or Latino	0 (0%)
American Indian or Alaska Native	0 (0%)
Asian, Native Hawaiian, other Pacific Islander	0 (0%)
More than one	2 (11.8%)
Education level	
Less than high school	0 (0%)
High school diploma or equivalent	0 (0%)
Some college, no college degree	6 (35.3%)
College degree or greater	11 (64.7%)
Sources of pain	
Back	12 (70.6%)
Arthritis	7 (41.2%)
Fibromyalgia	6 (35.3%)
Neck	5 (29.4%)
Neuropathy	5 (29.4%)
Headache	2 (11.8%)
Complex Regional Pain Syndrome	2 (11.8%)
Pelvic	1 (5.9%)
Other	6 (35.3%)
Number of sources of pain	
1	3 (17.6%)
2	7 (41.2%)
3 or greater	7 (41.2%)
Taking two opioids daily (remaining taking one)	10 (58.8%)
Daily morphine equivalents (mg)	165.22 $\pm$ 123.41 (30–510)

SD = standard deviation.

Table 3. Results of paired t tests on pain and psychosocial outcomes

Variable	Before Intervention, Mean (SD)	After Intervention, Mean (SD)	Mean Difference, Post – Pre (SE)	95% CI of Mean Difference	P Value
BPI-Severity	5.90 (1.14)	5.93 (0.89)	0.03 (0.26)	[-0.53, 0.59]	0.913
BPI-Interference	6.30 (1.89)	5.75 (1.62)	-0.55 (0.34)	[-1.30, 0.19]	0.131
CPAQ–Pain Willingness	16.15 (9.26)	25.46 (10.08)	9.31 (2.21)	[4.50, 14.12]	0.001
CPAQ–Activity Engagement	32.92 (11.70)	39.38 (12.55)	6.46 (2.83)	[0.31, 12.62]	0.041
CPAQ–Total Score	49.08 (19.03)	64.85 (18.80)	15.77 (3.93)	[7.22, 24.32]	0.002
PHQ-9 Depression	13.23 (6.11)	9.38 (3.80)	-3.85 (1.57)	[-7.26, -0.43]	0.030
MedBeliefs–Necessity	18.92 (4.25)	17.77 (5.92)	-1.15 (0.99)	[-3.30, 0.99]	0.265
Med Beliefs–Concern	15.69 (4.87)	15.23 (4.49)	-0.46 (0.85)	[-2.32, 1.40]	0.598
Med–Goal to reduce	4.23 (1.01)	3.85 (1.28)	-0.39 (0.27)	[-0.97, 0.20]	0.175

SD=standard deviation; SE=standard error; CI=confidence interval; Med=medication.

Bolded results are significant at P <0.05.

however, when we compared self-reported opioid dosages from before to after the intervention, we found no change. Of 13 participants, the mean opioid dosage in morphine equivalents decreased from 138.17 mg (standard deviation = 83.99) to 101.21 mg (standard deviation = 45.71).

Acceptability/Satisfaction and Perceptions of Treatment

Thirteen participants completed the semi-structured phone interview after the intervention and responded to general questions about any benefits they may have experienced and anything they would have liked to be different. They were not prompted about specific content or class attributes. All respondents reported benefit, and more than half offered constructive feedback. Qualitative analysis identified the following themes in participants' responses (described below): validation, acceptance, dialectic, pain gate, emotional well-being, pain medication, and constructive feedback.

Validation

All of the respondents expressed appreciation for feeling validated and less alone, with comments like, "it's not just me and my experience," and "shockingly there are others like me." This was also related to interactions with doctors and medication, e.g., "it wasn't just me having issues with doctors," and not having to "feel like a freak" for needing pain medication. One reported that the skills to cope with invalidation were most helpful, adding, "I have practiced that very actively." Most noted validation in the teaching style, as illustrated by this comment:

"[The instructor] would hear everybody and respond not only with validation, but would find the positives, even if we didn't do homework, she'd respond in such a calm and understanding way."

Acceptance

All respondents also named or described acceptance practices as benefits. This included comments about "figuring out what I am going to spend my pain on each day," the "willingness to accept the moment as it is," "being mindful of pain but still going on with my day," "no longer concentrating or dwelling on pain," and "radical acceptance—that's huge."

Dialectic

Most respondents mentioned benefits from the dialectical approach. One noted it helps that "it doesn't just have to be one thing or another," and another that "if there's is a good thing about pain, it's important to know and remember that, and also the fact that it will get better." Several provided specific examples of how they apply the dialectic, as illustrated in this comment:

"I am now thinking—the pain is there, and yes, if I walk the dog it will get worse, but I can still walk the dog, and I also do things to close pain gate, and I didn't used to—like listen to music, doing something enjoyable daily. Before I didn't want to be bothered."

About half mentioned the dialectic by name, noting that they were applying it beyond pain to other areas of their lives. One noted, "I replace 'but' with 'and' multiple times per day," and another shared, "I find myself thinking about the dialectic . . . so I don't get so upset or frustrated." As another member put it, the dialectical approach "is becoming part of who I am."

Pain Gate

Nearly all respondents referred specifically to benefits associated with the pain gate, including being "much more aware" of it, having "different things I can do to close it," and also being "present in the moment and aware of pain, but still going on with my day." One described the pain gate as "not just an exercise," but as something that has "changed how I deal with pain." Most shared examples of breathing and relaxation practices they were using to close the gate, including, "learning to relax when I'm in pain," "simple exercises to remind me to breathe," "learning how to calm down a little," and "meditating rather than sleeping." Pacing, imagery and visualization, not clenching, and finding balance (rather than "rushing from one thing to the other") were also mentioned by more than one respondent.

Emotional Well-Being

Although only a few used the DBT language of "emotion regulation," the majority referred to feeling calmer and less reactive, angry, upset, down, and frustrated. Most mentioned or provided examples of how skills practice was helping them with pain-related emotions and with emotionality overall. One explained, "I feel like I understand my emotions, motivations, and situations better and in a more objective way." Being able to be in "the present moment" was the most frequent response to the question of what they were doing differently, with nine people mentioning this. Multiple respondents also remarked on improvements in their outlook, ability to plan, be active, and engage with others. Some examples in their own words include:

"In the past, I would wake up in the morning feeling awful and wouldn't do anything that day. Now if I wake up in pain, I ask what do I think I can get done?"

"I'm worrying less about the future. I can kick myself out of a funk. I'm coping better in that way."

"When a situation becomes difficult or when I get to a bad place, I don't feel as distressed."

"I feel a lot more optimistic about my future quality of life and experience."

Reports of emotional well-being were more striking in comments by those who described less distress despite worsening symptoms and limitations. One shared that “even though I am struggling more physically, I cope with it better,” adding that “the skills have changed my day-to-day experience and relationships with my family, and because I am coping better and feel better able to express myself, I can get what I need.” Another described having intensified pain due to degenerate disease, “but I’m dealing with it, which is awesome.” These comments may shed light on post-test findings of improvement in pain acceptance and depression without accompanying changes in pain intensity or interference. One respondent even expressed regret that their improvements would be lost in the quantitative measures, adding, “but I feel so much better.”

Pain Medication

Even though opioid reduction is not a target of the intervention, the majority mentioned changes in their relationship with pain medication. One described the class as offering “options other than grabbing medication” and now practices relaxation and acceptance even when pain is high. Another reported stopping before taking medication to practice skills first, adding, “not that it’s bad to take the pills, but if I can do with less, it’s probably better.” Another described feeling “empowered” to face pain “without relying totally on pills” by “getting my mind in the right place and doing what I can to help myself.” Another described having “alternatives to medication to help manage pain mentally and physically,” adding that after trying unsuccessfully to reduce medication 2 years earlier, “I am transitioning to lower medication.” Several shared about their experience with current pressures to reduce opioid medication:

“Instead of getting really worked up . . . I’m able to think about it and deal with it on a much calmer level. Without this class that would not be the case.”

“I’m trying to decrease pills on my own. This makes me feel I have more ownership . . . and less a victim.”

“I’m using the stuff I learned to try to cut back on narcotics that I’m using. I’ve been able to decrease a little . . . I feel like I’m more able to control it, and control the thought of it better.”

“I recently realized I was going to run out of pain meds and my doctor was out of town, so I started taking fewer pills and weaning myself off, and through the withdrawal and pain I used skills from class.”

Another reflected on the way the class has helped with acceptance around the use of medication, explaining, “I am going through a period where I need more—but because of group I can take it with more understanding and acceptance. I don’t feel as guilty.”

A few offered comparisons with previous behavioral interventions they received. One participant who

benefitted from DBT for emotional distress reported that having familiar material applied to physical pain was “transformative” and that the participant felt “mentally bolstered to handle the pain.” Another mentioned that ACT was helpful and that this class “took it to another level,” and now, “I can accept with compassion.” Another, describing benefits from a CBT group, added that this group allows for more engagement in life “even when pain is there.”

Constructive Feedback

Participants overwhelmingly appreciated the group structure and dynamics. All described feeling understood by others and comfortable to share, and most identified things that the instructor did to encourage this. A few were bothered by class members who digressed or spoke too long. Some would have liked the instructor to intervene more often when this happened, and one suggested using a timer or talking stick. One reported being affected by the absence of some group members. Another expressed wanting to know more about other people’s health and pain conditions.

None of the participants provided critical feedback about the teaching materials, which included handouts, worksheets, and a weekly e-mail reminder that summarized what was covered. Most reported liking the handouts that accompanied each session, the homework assignments, and the emphasis on skill building. Nine mentioned appreciation for the variety of teaching methods, which included writing/drawing on the board, interactive exercises, and examples. Many specifically mentioned that they will continue to review the teaching materials to keep learning and practicing. One would have liked to have received additional reminders before each session.

With regard to the teaching style and content, most mentioned that the instructor was empathic or validating and explained the concepts in a way that participants could grasp. One participant suggested that the instructor should simplify the concepts. All respondents identified multiple positive aspects of the material covered. A couple did not like opening practices that involved focus on breath and guided imagery, and one member wished there had been more specific education about pain medication and discussion about how taking pain medication affects one’s life, “more like AA.”

Most participants were satisfied with the number, duration, and pacing of sessions. A few would have liked more time for the class material. This was reflected in suggestions that the group skip the mid-way break, meet for a longer period (12 or 16 weeks instead of 8 weeks), or allow people to participate multiple times. Another would have liked the class to end earlier to avoid traffic. Several desired more time with group members, and one reported that their group made plans to continue to meet on their own.

Of those who commented on the physical environment, about half mentioned benefits, including the ability to be comfortable and move around, and several mentioned appreciation for the hot/cold packs provided at each meeting. A few would have liked changes to the physical space—notably, more comfortable chairs and more room to spread out.

Discussion

This study demonstrates the feasibility and acceptability of a hybrid psychotherapeutic treatment for chronic pain, which we term DPM, which draws from DBT and integrates ACT and CBT for chronic pain. This study successfully enrolled enough participants over a 6-week period to provide two simultaneous 8-week groups, and 70% of those enrolled attended six or more of the sessions and reported high satisfaction with the intervention format and content. Only two participants (12%) withdrew from the study. This retention rate falls within an expected range for close-ended group interventions, which tend to have lower rates than individual therapy, especially when their members experience depression [101].

Following the lead of DBT's synthesis for people with emotional pain, DPM synthesizes acceptance- and change-based approaches to chronic physical pain to provide more validation to a population that is chronically invalidated and more options for a condition that requires a flexible array of strategies. All participants were receiving opioid medication for pain management.

Preliminary participant feedback supports this hybrid group intervention. Findings revealed significant increases in pain acceptance (both willingness and activity engagement) and reductions in depressive symptoms between the pre- and post-test assessments. These improvements occurred despite no significant accompanying change in pain severity or decrease in pain interference. Notably, two participants stated during interviews that despite a worsening in their pain and medical symptoms, they were experiencing less distress and felt more equipped to cope with pain severity. This may help explain the lack of reduction in pain scores, on average, accompanied by a reduction in distress and increase in acceptance. Moreover, because of the small sample size, a worsening in pain condition in only a few respondents could have a pronounced effect on the average pain score. In response to open-ended questions, the majority of respondents identified benefits from validation, acceptance, change, and dialectical strategies, and some reported increased well-being, even when pain increased. All participants described new ways to reduce pain and distress, reduced reactivity, and increased engagement in valued life domains. These promising findings need to be viewed with caution, as this was a small-scale feasibility study with no comparison or control group and was not powered to test pre-post changes or intervention

efficacy. A well-powered trial will help determine the effects of the DPM intervention, including its effects on self-reported pain levels.

On average, participants reported a high level of belief about the necessity of pain medication, as well as a goal of reducing their medication and concern about its negative effects. This dialectic reflects participants' current situation of having been prescribed opioids for pain management and now facing direct and/or societal pressure to reduce their reliance on these medications. Although the intervention did not focus on reducing opioids, nine (70%) participants described considering skills as an alternative to reliance on pain medication, and five (38%) participants reported reducing their dosages over 8 weeks. At the same time, no significant changes were reported in pain severity or interference. The data cannot parse the extent to which participants reduced medication in response to pressure or on their own initiative. Nonetheless, the majority reported feeling calmer about the prospect of reducing, and some had begun to experiment with reducing on their own by applying new practices. Thus, this intervention has potential as an adjunctive treatment for those who need or want to reduce opioid use.

Increasing the external validity, this study was conducted in a real-world setting with minimal exclusion criteria. All participants were receiving chronic opioid therapy, many were on high doses, and many were also suffering from comorbid mental health conditions, including depression, anxiety, bipolar disorder, BPD, and PTSD. Financial incentives were minimal. Participating in a weekly group, particularly in a hospital setting with parking difficulties and a sizeable walk from the garage to group room, demonstrates a high level of commitment.

DPM has multiple potential advantages. Its delivery in a group format, rather than one on one, is likely to be more time- and cost-effective for all involved. Moreover, group forums can be powerful for people who feel alone in their suffering [81], which is often the case with chronic pain, and this was born out in study participants' comments about feeling misunderstood by others and the benefits of feeling accepted, validated, and connected in the DPM group. The hybrid intervention integrates the effectiveness of ACT and CBT-CP through a both/and dialectical approach, along with DBT skills adapted for a population with chronic pain. Interviews with participants support the value of these skills for physical and emotional distress. Given the need for practitioners who can work effectively with chronic pain [102], the overlap of DPM with DBT skills groups would also contribute to the potential for a network of providers.

Although we reiterate that more definitive studies are needed, our results suggest that DPM might allow some individuals receiving chronic opioid therapy to reduce their opioid dose or eliminate opioids completely. For people with chronic pain, reducing reliance on prescribed

opioids presents a complex challenge. DPM offers the advantage of providing validation while also promoting skills for distress tolerance and pain control, as well as for emotional regulation, which also decreases vulnerability to opioid misuse and suicidality [62, 65]. Finally, evidence of systemic sensitization among people with chronic pain [48, 103, 104] may lend to support to an approach, like DPM's, that targets physiological distress, regardless of its origin.

Limitations

This study is a small-scale feasibility trial without a control group, which precludes making definitive statements with regard to efficacy, precludes subgroup comparisons, and cannot distinguish the effects of the group experience from the course content. Its skewed gender and racial composition poses further limitations. Although the sample reflects the higher rates of chronic pain (and particularly diffuse pain) and treatment-seeking behavior among women [105], the study nevertheless underrepresents the experience of DPM for men or what the effects would be in groups that were predominantly male. This is even more problematic when it comes to race. It is well documented, for example, that African Americans with chronic pain are at greater risk of undertreatment [106, 107] and invalidation by providers [108, 109]. African Americans with chronic pain also report greater pain intensity, distress, and interference with functioning [110, 111], especially those who are living in poorer urban areas [112]. Thus, any conclusions or generalizations about the effectiveness of DPM would need further testing with more diverse and representative samples as part of a larger, more definitive, randomized controlled trial.

Another set of limitations comes from the study's reliance on self-reported measures. Medication dosages and changes in dose were not verified by medical records or state monitoring databases. We also did not collect data on non-opioid pain medications or engagement with other pain treatments. Outcome survey and interview responses may also suffer from social desirability or other biases. In addition, there are some measures of feasibility that we did not collect, such as adherence to home practice, as well as standardized measures of intervention satisfaction and credibility, which would be useful to include in future studies.

Future Directions

It would be scientifically and clinically important to compare, using a randomized controlled trial methodology, DPM with one or more established psychotherapeutic approaches, such as ACT or another mindfulness-based intervention, or CBT-CP. In such a study, investigators could compare effectiveness of the interventions on pain severity, interference, and functioning and examine whether mediators and moderators differed across interventions, net of the group effects. Such information

would be useful to clinicians and patients for selecting the most appropriate treatment.

DPM may be particularly beneficial to people who have greater emotional distress and a heightened risk of invalidation. Validation seems particularly relevant for people with mental health vulnerabilities, as well as those contending with racism, sexism, and/or other intersecting systems of oppression that contribute to devaluation of a person's experience. Future studies should include systematic data on mental health comorbidities and recruit participants who reflect the racial, ethnic, gender, and socioeconomic demographics of those living with chronic pain. This would provide a more accurate assessment of the intervention and the potential contributions of individual characteristics.

In conclusion, although further study is needed to establish the efficacy and effectiveness of DPM, the introduction of a hybrid treatment modality for chronic pain is important because many individuals do not respond or only partially respond to medications or existing psychotherapeutic interventions. This intervention is theoretically promising, with the strength it draws from DBT's dialectical framework and integration of acceptance and change approaches to chronic pain management. Participants found DPM acceptable and reported increased acceptance and reduced emotional distress, and some also decreased their reliance on opioid medication. To adequately treat chronic pain, clinicians require a variety of possible treatment modalities, and DPM is a promising addition.

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