

# Implementation Outcomes From a Pilot Study of Mindful Awareness in Body-Oriented Therapy (MABT) as a Chronic Pain Treatment Modality in an Integrative Health Clinic

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## Abstract

**Background:** As regulation of opioid prescribing evolves, primary care and pain clinics are shifting to provide non-pharmacological and interdisciplinary chronic pain care. An under-utilized but growing area of health care for chronic pain is complementary and integrative health (CIH). However, there is limited availability of CIH approaches within the health care system. Mindful Awareness in Body-Oriented Therapy (MABT) is an evidence-based mind-body therapy, with a manualized protocol, that focuses on developing interoceptive sensibility for improved self-awareness and nervous system regulation. Prior MABT research shows MABT improves self-report and physiological indicators of interoception as well as mental and physical symptoms of distress.

**Methods:** This pilot single-group study used a hybrid implementation-effectiveness design and mixed methods to study implementation strategies and outcomes for bringing MABT into an integrative chronic pain clinic. Administrative data, staff surveys, and focus groups were used to understand the implementation process and outcomes (see Additional files 2, 3, and 4). Descriptive statistics were used to analyze survey and administrative data. A content analysis approach was used to analyze qualitative data from focus groups.

**Results:** 7 staff surveys were administered over the 24-month study period and showed high acceptability and appropriateness that increased over time. Adoption, feasibility, and sustainability were also high. Clinicians made 70 referrals to MABT, 56 patients scheduled a session, 41 patients completed at least one session, and 71% of these completed the protocol. Focus groups identified MABT as a therapy that filled a gap in services, particularly for patients with a lack of body awareness and high emotion dysregulation.

**Conclusion:** Implementation of MABT was highly successful in an integrative health clinic focused on chronic pain treatment.

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## Keywords

implementation and dissemination, mindful awareness in body-oriented therapy, chronic pain, interoceptive awareness, massage therapy

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## Introduction

Over 50 million adults in the United States report experiencing chronic pain—defined as pain on most days or every day. Chronic pain is negatively associated with quality of life and increases individual and system-level health care costs.<sup>1</sup> As regulation of opioid prescribing evolves, primary care and pain clinics are shifting to provide non-pharmacological and interdisciplinary chronic pain care, now considered best practice.<sup>2,3</sup> Under-utilized, but growing, are complementary and integrative health (CIH) approaches to address chronic pain. CIH combines conventional and complementary approaches,<sup>4</sup> evidence based mind-body therapies<sup>5-7</sup> and massage<sup>8,9</sup> for the non-pharmacological treatment of chronic pain. However, despite demonstrated effectiveness, the integration of such approaches into health care is limited; non-pharmacological treatments for chronic pain are prescribed less than 30% of the time.<sup>10-13</sup>

In recognition of this gap, the National Center for Complementary and Integrative Health (NCCIH) 2021-2025 Strategic Plan called for increasing the use of implementation science research methods and frameworks to “study and test strategies that facilitate uptake and adoption of complementary and integrative health interventions of proven effectiveness in real-world settings.<sup>3,14,15</sup>” Implementation science is a field that has emerged over the past 25 years and focuses on identifying barriers and facilitators to the uptake of clinical innovations and developing implementation strategies to support facilitators and mitigate or overcome barriers.<sup>16</sup> A growing number of CIH studies have started employing implementation science approaches but few have used the Consolidated Framework for Implementation Research (CFIR) and focused on implementation of integrative approaches to chronic pain.<sup>14,17,18</sup>

Common barriers to implementation of non-pharmacologic care for chronic pain into clinical practice are lack of awareness or knowledge of therapies,<sup>19</sup> lack of access to care, and cost.<sup>13</sup> Successful delivery and integration of mind-body approaches into clinic systems requires uptake by clinic stakeholders (eg, clinicians, leadership, administrators, support staff), along with adaptations in organizational processes and labor inputs.<sup>20</sup> In order to incorporate CIH therapies with a strong evidence-base into routine clinical care, research is needed to better understand barriers and facilitators at the health system and clinical level to elucidate what stakeholder support and structural changes are needed.

This mixed methods study reports on the implementation of a mind-body approach called Mindful Awareness in Body-oriented Therapy (MABT) in an academic CIH clinic serving patients with chronic pain. MABT is an evidenced-based approach designed to teach body awareness/interoceptive skills for symptom management and emotion regulation. MABT is delivered individually and has been shown to improve physical and mental health in multiple studies.<sup>21-25</sup> In this study, MABT was delivered by clinic massage therapists who were trained in this approach. The primary aim of

this study was to evaluate the implementation of MABT into a real-world clinic setting by examining 5 key implementation science outcomes: acceptability, appropriateness, adoption, feasibility, and sustainability.

## Methods

This study reports on the implementation strategies and outcomes from a pilot single-group study using a hybrid implementation-effectiveness design involving mixed methods. Patient health outcomes will be described in a forthcoming paper. This study was approved by the Institutional Review Board at Vanderbilt University Medical Center. The trial was registered with [ClinicalTrials.gov](https://clinicaltrials.gov) number NCT05289024.

## Setting

The site for this study was an interdisciplinary integrative health clinic at an academic medical center in the Southeast United States that specializes in the delivery of non-pharmacological treatment for chronic disease, with a focus on the treatment of chronic pain. Insurance is billed for most services and patients primarily have private insurance or Medicare.<sup>26</sup> Chronic pain diagnoses among patients vary widely, prominent among them are chronic musculoskeletal pain, chronic widespread pain and chronic visceral pain.

The clinic’s organizational structure is intentionally designed to support formal and informal collaboration among disciplines, clinicians, and support staff who interact with the patients.<sup>26</sup> The full clinic staff gathers weekly for an hour-long meeting focused on discussion and announcements related to patient care, education, and administration. Clinicians also have protected time to use for informal interdisciplinary collaboration. The front office staff are often asked by patients to describe the CIH approaches when scheduling appointments.

## Participants

Study participants were clinic staff, including clinicians, front office staff, and administrators. Four nurse practitioners, 5 health psychologists, 4 physical therapists, 3 massage therapists, 4 movement instructors and 1 acupuncturist comprised the clinicians. Five front office staff provided support for clinical services including scheduling, referrals, and clinic check-in. There were 4 administrators and support staff.

## Mindful Awareness in Body-Oriented Therapy (MABT)

MABT is an evidenced-based eight-session mind-body intervention with a manualized protocol for delivery,<sup>27</sup>

developed by 1 of the authors (C.P.). MABT involves psychoeducation, touch, and mindfulness to teach fundamental skills of interoceptive/body awareness. It is delivered using a sequential approach to incrementally build interoceptive awareness skills over time, involving body literacy (the ability to identify and describe sensory awareness), interoceptive awareness exercises (focused on gaining access to inner body experience), and mindful body awareness practice (to develop the capacity for sustained attention within the body and related somatic reappraisal processes). Take home practice is an integral component of this approach, to build capacity and integration of these skills in daily life.

Two massage therapists in the clinic were trained to deliver MABT prior to implementation of this project. The costs for their training were covered by the clinic continuing education budget. The massage therapists received consistent supervision from author (C.P.) over the study period, with a focus on delivery of the protocol and clinical care.

### Procedures

We used the Consolidated Framework for Implementation Research (CFIR) to plan for MABT implementation into the clinic.<sup>28</sup> The CFIR guide and the Proctor Implementation Outcomes Framework were used to identify priority implementation outcomes (acceptability, appropriateness, adoption, feasibility, and sustainability)<sup>20,29</sup> and informed development of evaluation approaches including staff

surveys, focus group guides, and health service data to track (eg, generation of referrals, service utilization).<sup>30</sup>

**Implementation Strategies.** Implementation strategies were identified from the refined Expert Recommendations for Implementing Change (ERIC) compilation during project planning and refined throughout the study with input from clinical stakeholders (leadership, front desk staff, and clinicians).<sup>4,31</sup> Published in 2015, in response to inconsistent language and descriptions of implementation strategies, the ERIC study used expert consensus to initially define 73 distinct strategies and then to group those strategies into 9 conceptually similar strategy clusters. The primary strategy clusters utilized in this study were: a) training and education of stakeholders, b) iterative strategies, and c) clinic organizational infrastructure. Figure 1 is a logic model that visually depicts this process and identifies implementation determinants, strategies, mechanisms, and outcomes.

**Training and Education of Stakeholders.** To educate stakeholders on what was involved in the delivery of MABT approach, we held educational sessions during the clinic’s regular interdisciplinary weekly meetings. During these meetings, members of the research team (the study PIs, and/or the massage therapists delivering MABT) presented on topics including guided experiential practice of the MABT protocol, overview of prior MABT study results, and MABT case vignettes based on delivery of MABT with clinic patients. Seven presentations were delivered over a 20-month time

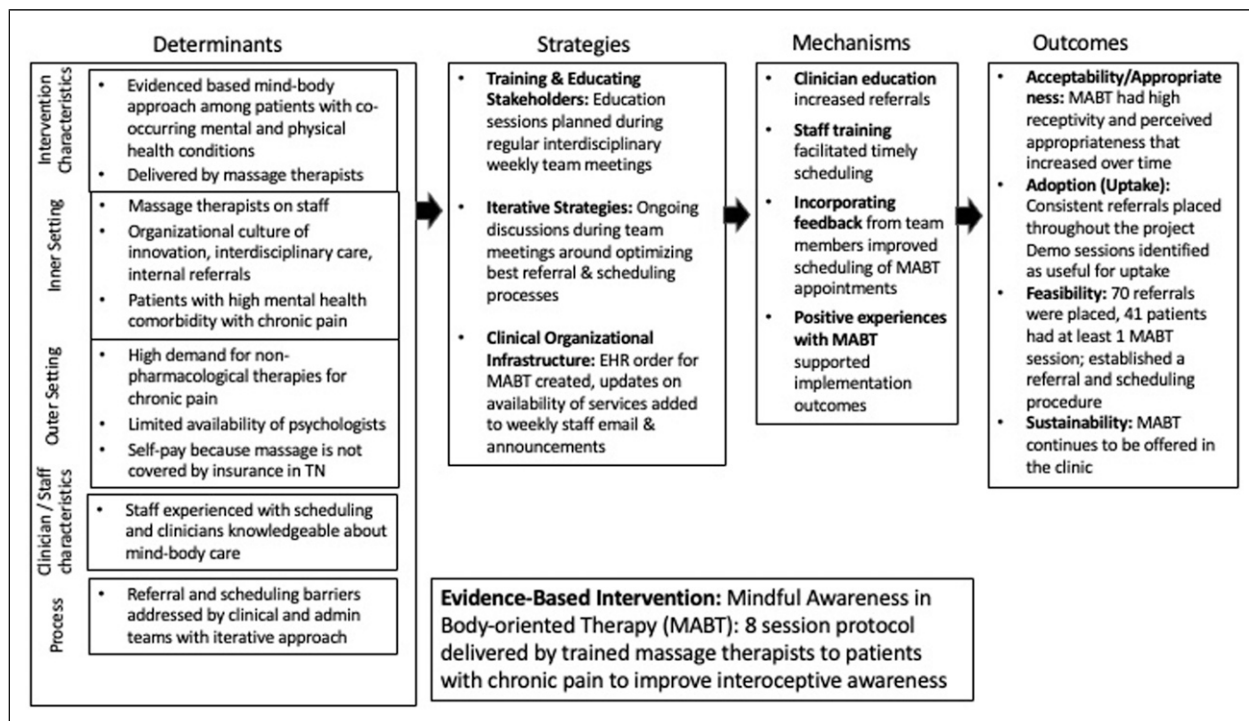


Figure 1. MABT logic model.

period (referrals were tracked for 24 months total). Presentations were initially delivered monthly (3 presentations), then quarterly (3 presentations), and every 6 months (2 presentations) toward the end of the project. In addition, the massage therapists on this project offered demonstration sessions to interested clinicians and staff to provide an experiential overview of MABT training components.

**Iterative Strategies.** Time was allocated during interdisciplinary team meetings to facilitate discussions on appropriate MABT referrals and how to optimize MABT referral and scheduling processes. Staff surveys were administered after each team meeting presentation to assess acceptability, appropriateness, and barriers/facilitators of MABT implementation. Feedback from surveys was used to revise clinic administrative processes to better manage referrals and scheduling of MABT sessions. For example, based on massage therapist feedback, the process for scheduling MABT sessions was changed so that appointments were not scheduled more than 2 weeks apart to maintain therapeutic flow. Additionally, front office schedulers changed the scheduling template so that there were protected MABT spots on the schedule for timely follow-up and scheduling in response to MABT referrals.

**Clinic Organizational Infrastructure.** An electronic health record order for MABT referral was created. Regular updates on availability of MABT slots in the schedule were incorporated into the existing infrastructure via weekly staff email and weekly staff meeting announcements. Front office staff also received education specific to the MABT approach (at the staff meetings or through demonstration sessions) to ensure that they could provide the patient education needed to respond to patient inquiries when scheduling sessions.

### Data Collection

**Staff Survey.** A staff survey was created using the CFIR interview guide (see Appendix 1) to identify clinician and staff perspective on MABT implementation into their clinic.<sup>30</sup> The initial survey was made up of 7 questions and the follow-up surveys were expanded to 31 questions. Surveys were administered to clinic staff at the end of each of the MABT education presentations. The survey addressed 8 areas related to implementation of MABT into the clinic: familiarity with MABT approach, familiarity with how MABT was being implemented in the clinic, receptivity to MABT, perceived clinical fit, change in infrastructure, sustainability, referral facilitators and barriers (see Additional File 1). Open-ended questions provided feedback and suggestions on improving implementation of MABT into the clinic. To address the risk of selection bias within the clinic, all staff and clinicians were surveyed.

**Process Measures.** To study the process of referring and scheduling patients with MABT, we tracked number of

referrals, type of clinician that made the referral (nurse practitioner, psychologist, physical therapist, or massage therapist), and result of the referral (scheduled, declined, unable to contact). To study patient response to MABT referral, we tracked number of sessions completed by patients (cancelled before session 1 vs number of completed sessions).

**Focus Groups.** Four focus groups were held with clinic staff during the final month of the study. To address the risk of selection bias within the clinic, all staff and clinicians were invited to participate in focus groups. Focus group guides (see Appendices 2-4) were developed after reviewing the preliminary staff survey responses and focused on perspectives of staff on MABT implementation (see Appendices 2-4). The focus groups were primarily organized by discipline (nurse practitioners; front office staff; mental health and physical therapists; massage therapists). Two study team members who were not clinic staff (CP; EB) facilitated the focus groups remotely over zoom. Focus group recordings and transcripts were utilized during analysis.

### Data Analysis

**Quantitative.** Descriptive statistics were used for compilation of the staff survey responses and process measures. Chart review of the electronic health record yielded patient demographic data, number and status of clinician referrals to MABT, and number of completed MABT visits.

**Qualitative.** Open ended questions from staff surveys were assembled into a spreadsheet and summarized descriptively. Themes were identified from each focus group transcript using content analysis.<sup>32</sup> Qualitative content analysis of focus group transcripts was done following the steps of preparation, organizing, and reporting. These steps were carried out independently by 2 of the authors (CP, EB) who then compared and discussed both deductive themes related to the implementation outcomes of focus in the study, including facilitators and barriers to implementation and themes that emerged inductively during analysis.

**Mixed Methods Integration.** Using the Consolidated Framework for Implementation Research (CFIR) as a guide, the authors iteratively integrated quantitative and qualitative findings during review of staff survey responses and focus group transcripts and themes. These iterative reviews involved contrasting the 2 data sources with the goal of explaining the quantitative findings and optimizing understanding and triangulating results.<sup>33</sup>

### Results

191 staff surveys were completed over 7 timepoints, involving the various clinic stakeholders (eg, clinicians, front desk staff, administrators, etc.) On average 27 stakeholders



completed each survey, at least 25% at each timepoint were clinicians. Due to changes in clinic staff over the 2 years of survey administration (retirements, new hires, new students/interns) the respondents at each survey time-point varied. As there was minimal variation in responses over time, the survey results are reported in aggregate.

Additionally, 4 focus groups were held with clinic staff stakeholders during the final month of the study to explore and explain survey results. Focus group participation were: nurse practitioners (n = 4), massage therapists (n = 2), psychotherapists and physical therapists (n = 8, four from each discipline represented), and front office staff (n = 2). Electronic health record data and patient questionnaires were used to track MABT referrals and appointments. Quantitative and qualitative findings are integrated and described below for each of 5 key implementation outcomes: acceptability, appropriateness, adoption, feasibility, sustainability (see [Appendix 5](#)).

### Implementation Outcomes

**Acceptability.** Acceptability, defined as “the perception among implementation stakeholders that a given treatment, service, practice, or innovation is agreeable, palatable, or satisfactory”<sup>34</sup> was assessed through a combination of change in knowledge of MABT over time and perceptions of both clinical advantage of MABT and overall receptiveness to MABT.

**Survey Results.** Knowledge about the MABT approach increased from “I know a little but not much” by 47% of respondents on the initial survey (n = 36) to 82% indicating “pretty knowledgeable” or “extremely knowledgeable” on the combined follow-up surveys (n = 155). This overall indication of understanding the intervention sets an important foundation for interpreting the validity of other items on the questionnaire specific to MABT acceptability.

A second survey item asked about the perceived clinical advantages of offering MABT. Across all follow up surveys, respondents (n = 155) endorsed: innovation (n = 124, 80%), collaboration between clinicians (n = 114, 74%), gap in clinical need (n = 102, 66%) and financial (n = 41, 27%). These perceived advantages of offering MABT did not noticeably change across survey time points.

Similarly, at every follow-up survey time-point, most respondents (n = 113, 73%) perceived receptivity to MABT at the clinic as “excellent.” A few people at each time point endorsed “open but not sure.” No respondents, at any time point, described themselves as being “skeptical” in their receptivity to MABT.

**Focus Group Findings.** Focus group findings were consistent with staff surveys and elaborated on the perceived high acceptability of MABT among stakeholders. For example, one nurse practitioner said that she thinks of referring to MABT

when a patient has trouble identifying feeling words, or when a patient with difficulty identifying how they feel, or says that they would like massage but don’t really like being touched.

**Appropriateness.** Appropriateness is defined in the Proctor et al,<sup>34</sup> model as “perceived fit, relevance, or compatibility of the innovation or evidence-based practice for a given practice setting and/or to address a particular issue.”

**Survey Results.** Two survey items best illustrated positive change and an overall high level of perceived appropriateness of MABT. The first was a question about whether MABT would meet the needs of clinic patients. At baseline, a slight majority of responded “very well” (n = 19, 53%), and many others responded “not sure/don’t know” (n = 11, 31%). After the initial educational presentation on MABT, 88% of the respondents endorsed “very well” across the follow-up surveys (ie, surveys 2-7, n = 136) and “not sure/don’t know” dropped to 3% (n = 4). Additionally, over the course of study implementation, there was a growing perception that MABT fit into the values/norms of the organization. At baseline, 61% (n = 22) of clinicians and staff responded to an item asking if MABT fit into the values/norms of the organization with “very much so,” while 28% (n = 10) selected “not sure/don’t know.” In the following 6 follow-up surveys, only 1% (n = 2) selected “not sure/don’t know” while 95% (n = 147) selected “very much so.”

**Focus Group Findings.** Focus group responses highlighted overall agreement among clinicians and across clinician types (ie, nurse practitioners, psychotherapists, physical therapists, and massage therapists) that MABT addressed a gap in services and was thus highly appropriate for clinic patients. Three primary themes emerged related to MABT filling a gap in services.

Theme 1: MABT provides new skills for emotion regulation which are important for mental health and symptom management. For example, one Nurse Practitioner said: “*When MABT helps people it seems to help what they’re most distressed by... it is generally good for decreasing distress from somatic symptoms and pain, and helping people to not be overwhelmed by their experience. I’ve heard patients say, “I finally learned: people have been telling me for years about pacing – but now I understand it in my body. Now I have this relationship (to my body) and skill set to do something different.” When we talk about regulating symptoms – it sounds like a small thing but we are talking about people who are paralyzed: we’re talking about people who are shut in to their houses, are not eating, not sleeping, not functioning, sometimes not even speaking. It’s not just having their pain change from a 7 to a 5. For these people to be able to manage their distress and change their relationship to it, and then be able to have a whole new world open to them – that is absolutely life changing. These are not everyday symptoms – this is significant loss of function and*

quality of life because of overwhelm – we see a lot of psychogenic pain, people who have POTS, people who are losing jobs, marriages, housing etc. so it's a big deal [for them] to get out of something that has been paralyzing them for years." MABT is a unique way to learn these skills that works for some people. I've also had patients who've said "no, didn't like it" – it just wasn't for them – was too hard, or whatever. But more patients have expressed increased ability to work with their experience and down-regulate their distress."

Theme 2: Use of touch and use of an individualized approach are critical to target body awareness, as exemplified in this quote from a Nurse Practitioner: "Many of our services (groups and psychotherapy) teach similar skills to MABT but there are patients who aren't comfortable in a group or they are so in their heads intellectually that they can't get in their bodies. They need to have someone use touch and guide them to learn these skills."

Theme 3: MABT can be very helpful for clients who have significant mental health distress from anxiety, depression and/or trauma. Psychologists emphasized that MABT can be a good complement to psychotherapy, while in contrast, nurse practitioners emphasized that MABT may particularly benefit the high numbers of patients who aren't engaged in psychotherapy but need more mental health support. A few patients engaged in both psychotherapy and MABT and this was perceived as highly complementary: "One patient in particular had really amazing breakthroughs during MABT which she knew were important ...and brought this into our sessions to analyze further in psychotherapy."

In addition, the focus group results highlighted for whom MABT was perceived to be most appropriate. There was overall agreement among clinicians, and across clinician types, that MABT referrals were most appropriate for clients who would benefit from more sensory (physical and emotional) awareness and regulatory capacity, as exemplified by the following 2 quotes. This first quote is from a Physical Therapist, speaking to who might benefit from MABT: "Patients who have some insight into their mind-body connection but they are really not able to move forward, despite our best efforts at education, to recognize the holding patterns within the body. A lot of times this is the patient who lacks safety in their body, and in spite of stretching and manual work which might improve their symptoms very temporarily [in PT sessions], they are not able to engage outside of our guided sessions to soften, or relax, or be aware of the level of holding in their bodies." This second quote is from a Nurse Practitioner: "MABT is good for folks that get into a cycle of pain, where it is really high and takes days to recover from; those who would benefit from breaking this experience down by increasing awareness of their body and can apply skills of mindfulness, breathing etc. to decrease the threshold and increase their ability to manage. I use this type of criteria to decide who to refer to MABT more than any [specific] diagnosis."

The following patient characteristics were highlighted as being particularly appropriate for MABT referral:

- an interest in increasing their body awareness and mind-body connection.
- difficulty assessing their emotions or have low emotional awareness or high experiential avoidance.
- the tendency to be easily overwhelmed by somatic distress and difficulty with emotion regulation and/or pain management.
- psychotherapy experience but have not yet "landed" in their body to integrate what they know intellectually and what they experience somatically.

**Adoption.** Adoption, defined as "the intention or action to employ an innovation or evidence-based practice (eg, uptake)",<sup>34</sup> was evident in referrals and engagement with implementation strategies.

**Process Measure Results.** Approximately 3 referrals/month were made over the course of the 24-month study. The majority (87%) of referrals were from Nurse Practitioners. Referrals were consistent over the course of the project, with some uptick that appeared to be in response to educational presentations or MABT referral announcements at staff meetings (referral announcements were only made when there was space in the schedule for new MABT referrals).

**Survey Results.** From the stakeholder survey we learned over half of the respondents (56%), on any 1 survey of the follow-up surveys, had contact with a patient who had received MABT. The respondents indicated, across all follow-up surveys, that the helpful resources for facilitating the discussion of MABT with a patient or a subsequent referral were: a) learning about MABT in educational presentations at staff meetings, b) hearing clinical vignettes highlighting patient experiences from interventionists at staff meetings, and c) team announcements requesting MABT referrals. Other helpful uptake strategies/resources were identified as the MABT informational flyer, and the specific MABT referral order in the electronic health record.

In addition, stakeholder survey responses indicated that understanding procedures for making MABT referrals improved over time, which facilitated adoption. For example, on the initial stakeholder survey, 8% of respondents described themselves as "extremely knowledgeable" about how MABT would be implemented (ie, knowing how to refer, how to schedule sessions, and knowing who will provide MABT), and 42% reported they "know a little bit but not much." In contrast, on the final survey, only 5% of respondents reported they "know a little bit but not much" while 81% described themselves as "extremely knowledgeable."

**Focus Group Results.** These points above were reiterated within the focus groups, for example 1 clinician noted: "We

have team meetings and educate staff on MABT – case report vignettes help everyone remember this treatment option.” The focus groups also highlighted that receiving an MABT demonstration session from 1 of the MABT therapists was particularly useful as an uptake strategy. While only a few staff took advantage of the opportunity to receive a MABT demonstration session, the positive impact on uptake was clearly stated by both nurse practitioners and front office staff, for example a Nurse Practitioner said: “I got a demo session so had my own experience to know what MABT is, which was key for me to refer to MABT appropriately.”

**Feasibility.** Feasibility is defined as “the actual or successful use or implementation of the intervention with the clinical setting.”<sup>34</sup>

**Process Measure Results.** Seventy MABT referrals were made during the study period and the majority of those referred ( $n = 56$ ) scheduled MABT sessions. Of the 41 patients who had at least one session, 71% completed the intervention, defined as attending 75% MABT sessions (ie, 6 or more sessions), see Figure 2. Patients referred to MABT reflected the demographics of the larger clinic patient population: mostly female, majority identified as White, a wide age range (22-79 years), and 1 or more pain diagnosis.

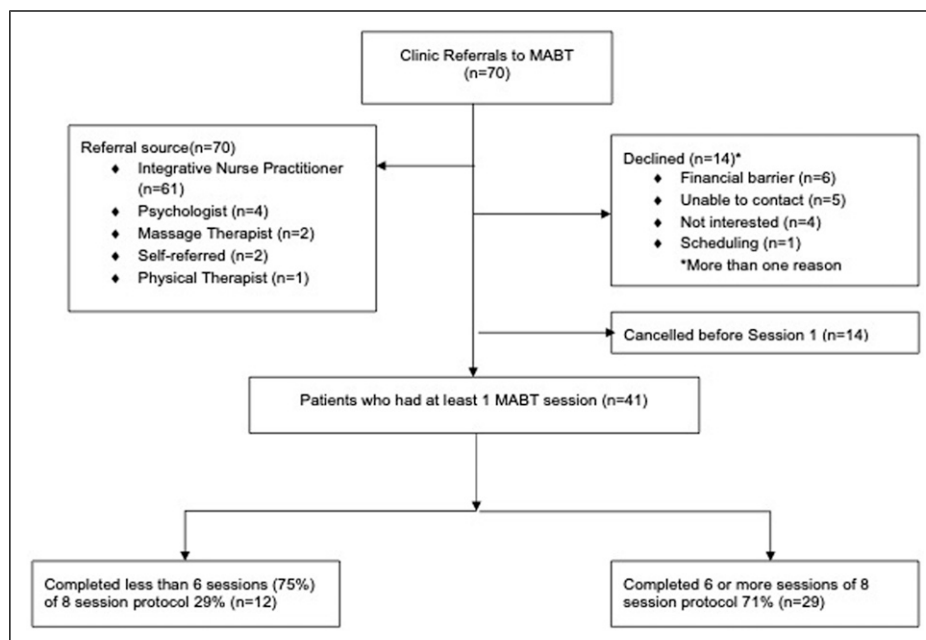
**Survey Results.** Stakeholder survey items specific to feasibility were mostly focused on infrastructure knowledge specific to MABT implementation (and its improvement over time) as iterative strategies were used to identify topics for ongoing educational activities and/or infrastructure changes. Stakeholders indicated early on that infrastructure changes

were needed to accommodate MABT within the clinic and related changes to the referral and scheduling processes were put into place. On a survey mid-way through the project, a survey item asked if referral and scheduling processes had improved; 60% of the respondents indicated that scheduling was easier, 24% indicated no change, and the remaining respondents indicated that they were unsure or unaware of any changes made.

**Focus Group Findings.** From the focus groups we learned MABT referrals were sent forward to front office staff for scheduling for almost any patient who expressed interest in MABT. There were, however, a couple exceptions, including when patients expressed inability to pay for health care services out of pocket or when patients only felt comfortable with female providers (MABT therapists were male).

Across all focus groups, there was agreement that ability to explain the MABT approach was critical for successful referral and enrollment in the MABT program. The psychotherapists expressed a lack of familiarity with MABT even with the educational presentations and thus some challenge with this; in contrast the nurse practitioners described their process of developing language for successful communication of the MABT approach and highlighted the importance of explaining how MABT can facilitate nervous system regulation to address the client’s personal challenges and treatment goals.

Both the nurse practitioners and the front office staff discussed how helpful demonstration sessions were for coming up with their own explanations of the MABT approach so they could respond to any related client inquiries in the referral or scheduling process. As described by one front



**Figure 2.** Response to referral.

office staff, *“I understood how to explain interoceptive awareness but having the experience [from the demo session] helped me think about how to describe it in the easiest way for patients so people from all educational levels could understand me. I could read about it, but the demo session gave me an experiential understanding of it.”*

In terms of the actual scheduling, front office staff highlighted the importance of arranging all 8 sessions upfront but suggested that the messaging should be that patients can drop out at any time (versus committing to attending all 8 sessions of the program); this messaging would thus match the payment approach which was to only pay if a session was attended. The most common reason patients gave for *not* scheduling was financial ( $n = 6$ ), in addition, there were 5 patients that the front office staff were unable to contact for scheduling purposes.

Notably, the front office staff emphasized in the focus group, the high completion rate of the MABT program relative to other clinic programs, exemplified in this quote: *“This [completion rate] is especially successful based on who our patients are.”*

**Sustainability.** Sustainability is defined as “the extent to which a newly implemented treatment is maintained or institutionalized within a service setting’s ongoing, stable operations”.<sup>20</sup> MABT continues to be offered in the clinic since the end of this study.

**Focus Group Findings.** A key barrier to sustainability that was identified in focus groups was the current lack of insurance coverage for MABT. There was general agreement across focus groups that having insurance coverage available for MABT would facilitate MABT referrals, increase patient demand, and help to expand the service. The front office staff highly recommended that MABT training should be offered to more clinicians on staff (eg, psychotherapists and/or nurse practitioners, as well as massage therapists) to: a) increase the availability of MABT appointments in the clinic schedule and b) open up opportunities to bill insurance for this service. *“Billing would be a game-changer. Patients report extreme benefit; the important thing to do is to train those who can bill insurance. If clinicians were cross-trained, then we could offer MABT with the provider that makes the most sense for the patient depending on whether or not they have insurance, and what type of insurance they have. We can then decide how to schedule to best meet the individual client’s situation; this would require more training, but we could do it.”*

## Discussion

Results of this mixed methods pilot study demonstrate successful and sustained implementation of MABT into an integrative health clinic focused on chronic pain treatment. Across the clinic stakeholder and clinician types, MABT was perceived to be uniquely helpful, highly satisfying to clients,

and important to continue and expand as a clinical service. Focus group discussions offered additional context and explanation as to how and why implementation of MABT was successful and described the widespread perception that MABT facilitates regulation and coping with distress, including pain, and can have “life-changing effects.” A second manuscript reporting on the health outcomes of this pilot is forthcoming.

Iterative implementation strategies were well-received and included training and changing clinical infrastructure related to referrals and scheduling. It is noteworthy that among the various health care providers, nurse practitioners made the majority of MABT referrals. However, given that the nurse practitioners are the providers who conduct all clinic intakes and initial referrals in treatment planning this is not surprising. Importantly, the medical director and 1 of the nurse practitioners at this clinic initiated this project; the importance of having buy-in by clinic leadership and the role this has in adoption should not be overlooked as an important aspect of the inner setting clinic context when planning future studies.

This study demonstrated that MABT filled a unique clinical gap. This was particularly true for chronic pain patients who had plateaued in other services and had difficulty with emotion regulation or poor body awareness. This may indicate a unique and important role for therapies targeting interoception and/or are individually delivered, even when mindfulness classes, traditional massage, and movement therapies are already available as they were at this clinic. More study is needed to determine best practices for matching patient needs with various mind-body therapies that are available and when to consider adding or switching approaches.<sup>35-37</sup>

The importance of being able to explain the rationale, approach, or utility of MABT to patients was also noted as critical for adoption across all types of health care providers and front office staff. Findings highlight the helpfulness of demonstration sessions to provide *experiential* understanding to clinicians and staff of the intervention and related critical importance this had in facilitating the ability to explain what to expect from the MABT approach. After hearing this feedback so clearly in the focus groups, as well as how underused this experience was among clinic staff, this is the 1 implementation strategy we would do differently and highly recommend for future research. We suggest promoting demonstration sessions early on, maybe even prior to the start of the study, and to create easy opportunities for clinic staff to receive them. The high adoption rate among front office staff, and the critical role they likely played in explaining MABT and its possible benefits to patients, as well as their role in identifying possible helpful structural changes to ease referral and scheduling processes, points to the importance of non-clinical staff in patient interactions and implementing changes within the organizational system.

Despite growing demand for CIH approaches, and evidence for non-pharmacological treatments for chronic pain, only 15%



of adults receiving massage therapy in the United States have partial or complete health insurance coverage for this care.<sup>38</sup> Due in part to limited insurance coverage, consumers spend \$18.8 billion annually on massage therapy, primarily outside the conventional health care system.<sup>39</sup> This trend emphasizes the need to study how to better integrate this evidence-based care within the health care system. Although widely used, the limited availability of massage therapy in medical settings represents a missed opportunity for interdisciplinary pain clinics. Expanding access to MABT and other evidence-based integrative therapies as an insurance covered service should be a priority for policymakers. Without such coverage, despite being acceptable, appropriate, adoptable, feasible, and sustainable, it is unlikely that MABT will become widely available to patients with chronic pain.

The study clinic serves an insurance-based population<sup>26</sup> so the patient utilization of a non-insurance service was notable. The positive results regarding the feasibility and sustainability of MABT into the clinic's system were also encouraging. As far as we know, this is the first implementation science study where patients had to pay out of pocket for the CIH intervention being studied. Despite the fact that the clinic mostly delivers insurance-billed care to a middle-class population, all massage at the clinic is paid out of pocket. In this study, the value of the service seemed to overcome this barrier as evidenced by the substantial number of people ( $n = 29$ , 71%) that chose to pay for MABT out of pocket. Cost is often identified as a barrier for recommending evidence-based therapies not covered by insurance.<sup>40,41</sup> However, typically only the patients who are informed, ie, have access *and* can pay, have the ability to receive interventions like MABT. Until insurance provides coverage for evidence-based services recommended in clinical guidelines for chronic pain,<sup>42,43</sup> access will continue to be limited. None the less, our findings suggest that among those who can pay, having robust processes for informing clinicians and patients about the processes and potential benefits of non-pharmacological therapies are also essential for successful implementation of CIH approaches into clinical practice.

This was the first study of MABT using implementation science frameworks and methods. The study team found these approaches useful in planning for, implementing, and evaluating MABT in the CIH clinic. Using the CFIR framework and a logic model to identify and align determinants, implementation strategies, mechanisms and implementation outcomes was particularly useful. For example, clinicians and staff identified educational presentations as the most helpful strategy to support uptake and adoption, and these played crucial role in supporting the high acceptance and adoption of MABT within the clinic. The need for ongoing education about MABT due to staff turnover highlighted an important challenge in implementing a new approach in clinical care settings, and points to how essential continuous education is to maintain knowledge and competence among the clinic staff and to ensure the sustained

integration of new CIH approaches like MABT in clinic services.

### Limitations

Limitations of this study include the 1 group design and single site for implementation. Because this study took place in an integrative health clinic, the generalizability to more conventional clinic settings may be limited. Nonetheless, the high adoption rate and high patient engagement in the MABT program observed in this study, in conjunction with similarly high engagement in community settings in prior MABT studies, point to the potential viability of implementing and sustaining the delivery of this mind-body CIH protocol in clinical practice. Further research is needed to determine the best practices for the uptake and sustainability of integrative and somatic approaches in health care settings, including comparisons of implementation successes and challenges across different clinical environments and CIH approaches.

Notably, this study benefited from the study clinic organizational and budgetary structure, which provides generous continuing education budgets for its clinical staff and thus the funds needed to cover the MABT training costs involved. This is not typical, as CIH providers are often not integrated into the organizational and budgetary structure with equitable access to continuing education opportunities. We suggest that continuing education budgets are designed to ensure access for all CIH practitioners to promote integration of new evidenced-based approaches into clinical practice.

### Conclusion

This study offers valuable insights into the barriers and facilitators of MABT implementation in clinical care, providing a model for bringing mind-body therapies into routine clinical practice. MABT implementation in the CIH clinic was successful and findings highlighted that MABT addressed a gap in clinical care of chronic pain by targeting body awareness, particularly helpful for those with experiential avoidance and emotion regulation difficulties. Larger studies of MABT for chronic pain with more diverse populations are needed in the future to further examine implementation in both integrative and conventional settings.

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### Author Contributions

C.P., K.H. and E.B. all contributed to the conceptualization and design of this study. K.H. conducted and analyzed staff survey data, C.P. and E.B. conducted focus groups and qualitative analyses. C.P., K.H., and E.B. all contributed to the drafting and revision of this article. All

authors have approved the submitted version and are personally accountable for their individual contributions to this study.

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The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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### Ethical Statement

#### Ethical Approval

This study was approved by the Institutional Review Board, Integrated Sciences Committee at Vanderbilt University Medical Center (approval # 201931).

#### Informed Consent

Retirement for informed consent to participate was waived by the Institutional Review Board.

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### Supplemental Material

Supplemental material for this article is available online

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