Assessing the Quality, Efficacy, and Effectiveness of the Current Evidence Base of Active Self-Care Complementary and Integrative Medicine Therapies for the Management of Chronic Pain: A Rapid Evidence Assessment of the Literature

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Abstract

Objectives. Chronic pain management typically consists of prescription medications or provider-based, behavioral, or interventional procedures that are often ineffective, may be costly, and can be associated with undesirable side effects. Because chronic pain affects the whole person (body, mind, and spirit), patient-centered complementary and integrative medicine (CIM) therapies that acknowledge the patients’ roles in their own healing processes have the potential to provide more efficient and comprehensive chronic pain management. Active self-care CIM (ACT-CIM) therapies allow for a more diverse, patient-centered treatment of complex symptoms, promote self-management, and are relatively safe and cost-effective. To date, there are no systematic reviews examining the full range of ACT-CIM used for chronic pain symptom management.

Methods. A systematic review was conducted, using Samueli Institute’s Rapid Evidence Assessment of the Literature methodology, to rigorously assess both the quality of the research on ACT-CIM modalities and the evidence for their efficacy and effectiveness in treating chronic pain symptoms. A working group of subject matter experts was also convened to evaluate the overall literature pool and develop recommendations for the use and implementation of these modalities.

Results. Following key database searches, 146 randomized controlled trials were included in the review.

Conclusions. This article provides an introduction and background to the review, summarizes the
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methodological processes involved, details the initial results, and identifies strengths and weaknesses of the review. Specific results of the review as well as overall recommendations for moving this field of research forward are detailed throughout the current Pain Medicine supplement.

Key Words. Self-Care; Complementary and Integrative Medicine; Chronic Pain; Rapid Evidence Assessment of the Literature; Systematic Review

Introduction

Complexity and Challenges of Chronic Pain

Chronic pain is pervasive and presents medical and economic challenges. Its impact on both the health of average Americans and related medical expenditures has been increasing at an alarming rate over the past decade. Recent estimates of the numbers of Americans suffering from chronic pain equal nearly 100 million [1]. Approximately 96% of chronic pain patients taking opioid medication suffer from low back pain in addition to joint, muscle, neck, upper back, arthritis, and headache/migraine pain. Although chronic pain is typically defined as any type of pain lasting longer than 3 to 6 months [2,3], many chronic pain patients have endured pain for more than a year [4], and many for more than a decade [5]. The high prevalence of pain not only significantly burdens the individual but also presents a very costly price tag in terms of national economic impact and burden. In fact, in 2008, 14% of total Medicare expenditures were for pain—nearly one-fourth of the total $500–600 billion U.S. medical expenditures for pain [1].

Chronic pain is complex, often affecting individuals physically, mentally, socially, and spiritually. This results in a common symptomatic and functional spectrum of physical, cognitive, psychological, and behavioral effects [4,6,7]. Decreased physical functioning coupled with little hope for effective treatment often results in a downward spiral of depression, distress, anxiety, and sleep problems, which lead to impaired social functioning and family relationships that all increase perceived pain [7].

The recent conflicts of Operation Iraqi Freedom/New Dawn and Operation Enduring Freedom have put the health implications of chronic pain front and center for the Department of Defense (DoD) and the U.S. Department of Veterans Affairs. In fact, military service members with chronic pain have higher rates of depression, posttraumatic stress disorder, and somatization-like illness [8]. With more than 50,000 service members wounded in action [9] and estimates of nearly 80% of veterans returning from these conflicts with chronic pain, it is imperative to identify and develop appropriate chronic pain treatment approaches [10].

Current Treatment Approaches for Chronic Pain Management

The high prevalence of chronic pain in the United States creates demand for the development of pain management programs with effective treatment approaches [10]. Traditionally, chronic pain management has depended on conventional approaches consisting of prescription medication or provider-based behavioral or invasive procedures (e.g., neurostimulation for intractable pain, assistive devices for mobility and activities of daily living, electrical and thermal modalities, injections, or neurolytic interventions). Use of opioids, steroids, nonsteroidal anti-inflammatory drugs, and other analgesics has significantly increased in recent years, with reports of over 50% of chronic pain patients taking over the counter or prescription medication as part of their treatment [11]. Such treatments, however, can be costly, cause medication dependence and potential abuse, may be associated with serious side effects [12,13], and can carry a stigma, particularly in military populations [14,15]. Conventional approaches are also often disease and specialty based, primarily focused on treating the etiology of pain with less attention paid to the whole person and the multitude of factors that can exacerbate pain symptoms (e.g., emotional stress, social relationships) and the patient’s overall well-being.

Complementary and Integrative Medicine Approach for Chronic Pain Management

Chronic pain, given its complexity and comorbidity, may be better treated with the integration of active self-care (ACT) approaches utilizing complementary integrative medicine (CIM) therapies that espouse an integrative, biopsychosocial approach (i.e., ACT-CIM). Such approaches acknowledge the person as a whole, while considering the interplay of biological, psychological, and social/cultural factors and recognize the patient’s own capacity to heal as an integral component in disease management [16]. The intrinsically patient-centered nature of ACT-CIM therapies focuses on empowering individuals [17,18] to actively engage and collaborate with providers in determining the best integrative approach—in terms of effectiveness, safety, and cost—to help them manage their chronic pain. This transformation of medicine from a provider-directed to a patient-centered focus with patients assuming an active role has not only promoted the utilization of CIM, but is also associated with improved health outcomes, lower health care costs, higher patient and provider satisfaction, and increased self-efficacy [19–22]. Moreover, individuals can use the majority of CIM modalities, as self-management tools as they are easily learned and can be practiced almost anywhere, reducing much of the stigma associated with seeking help at more public clinics, hospitals, and provider offices. Consequently, this approach results in a reduced reliance on the health care system that translates into greater social benefit from reduced health care costs, both from the primary treatment of pain and the complications associated with its management, as well as improved...
worker productivity, employee retention, and lower disability-associated expenses.

Overall, the potential effectiveness, portability, low cost, logistical simplicity, and non-pharmacologic nature of ACT-CIM therapies makes them ideal techniques for pain management within existing comprehensive care models. Current research supports the growing acceptance of CIM usage in the treatment of medical [23] and psychological problems in both civilian [24] and military populations [25–27].

**Purpose**

As the number of chronic pain sufferers continues to increase, there is a greater urgency and call for additional evaluation and research of ACT-CIM therapies [3]. Research efforts have begun to pinpoint the underlying and interacting mechanisms of pain at both a neuro-physiologic and cognitive level, thus leading to the identification of novel pragmatic and effective pain management approaches. In order to ensure maximum benefits (e.g., improved quality of life, pain, and related comorbid symptoms) for both patient and health care systems are gained, approaches should be consistently and reliably evaluated, and the most promising modalities, in terms of efficacy, effectiveness, safety, cost, and feasibility, should be incorporated.

Many CIM modalities that have been accepted into existing pain management systems have not been systematically assessed in terms of the most important variables of efficacy, effectiveness, safety, cost, and feasibility. In an era of limited health care budgets, this information is essential if informed value judgments concerning pain therapies are to be considered valid. The Army Surgeon General’s Pain Management Task Force (PMTF) [3] and Institute of Medicine [28] have begun to draw attention to these needs, and identify and recommend active self-care integrative therapies that require minimal training and can be practiced by patients on their own. Research exists regarding these modalities; however, questions regarding efficacy and safety still need to be addressed. While there are several reviews investigating the usage of some of these modalities for the treatment of a variety of specific chronic pain conditions, to date, there are no systematic reviews that comprehensively assess all modalities for the treatment of chronic pain symptoms. Therefore, the purpose of this systematic review is to assess the current scientific literature to determine the quantity, quality, efficacy, effectiveness, and safety of ACT-CIM modalities identified by the PMTF as well as additional ACT-CIM modalities identified by the authors, for the management of chronic pain symptoms.

**Methodology**

A systematic review of the literature was conducted using Samuel Institute’s systematic review process known as the Rapid Evidence Assessment of the Literature (REAL©). The REAL is an efficient methodological process designed to streamline the systematic review process and aid in the rigorous, reliable, and proficient evaluation and review to facilitate evidence-based health care decisions. The primary goals of the REAL process are to 1) survey the available English, peer-reviewed literature using a standardized search strategy tailored to a specific research question; 2) evaluate the quantity and quality of the literature using structured tools and rulebooks designed to ensure objectivity, reliability, and reproducibility of reviewer ratings; and 3) obtain formalized input from subject matter experts (SMEs) regarding the implications of the evidence garnered from the review process for current practice and future research.

The REAL approach differs from a conventional systematic literature review in that it is designed to facilitate rapid conduct of rigorous, high-quality, transparent, evidence-based systematic reviews that provide an evidence “snapshot” of what exists in the literature for any intervention or claim. Additionally, because REAL incorporates an assessment of the overall literature pool and its current implications for research and practice, it can provide a basis for assisting SMEs in determining the quality of the research as a whole, identify gaps in the literature, and assess effectiveness of the intervention in question. This process also facilitates making recommendations for appropriate next steps in policy, funding, research, and clinical decision making. To date, this methodological process has been utilized by a variety of organizations posing research questions needing systematic review methodology both within and outside of the DoD [6,29,30].

**Concepts and Definitions**

The authors used the following definitions for purposes of this review.

**Chronic Pain**

The PMTF [3] uses the following definition for chronic pain:

Chronic pain continues beyond the normal time expected for healing and is associated with the onset of pathophysiological changes in the central nervous system that may adversely affect an individual’s emotional and physical well-being, cognition, level of function and quality of life. Chronic pain serves no apparent useful purpose for the individual and may be diagnostically and therapeutically approached as a chronic disease process. It cuts across the boundaries of mind, brain and body, resulting in a common symptomatic and functional spectrum of physical, cognitive, psychological and behavioral effects. Chronic pain can be described as ongoing or recurrent pain, lasting beyond the usual course of acute illness or injury for more than 3 to 6 months, and which adversely affects the individual’s well-being. A simpler definition for chronic or persistent pain is pain that continues when it should not.

For this review, the authors have adapted this definition, and define chronic pain as either 1) any condition with pain lasting longer than 3 months; or 2) any pain condition that is considered, by definition, to be chronic [2]. This
definition was also previously used in another REAL relat-
ting to components of the trauma spectrum disorder,
which involved input from pain experts in the field [6].

ACT-CIM Practices

For the purposes of this review, the authors define ACT-
CIM practices as those which 1) incorporate comple-
mentary medicine with conventional medicine as a col-
laborative and integral part of the health care system; 2) 
involve shared patient care, practice guidelines, and
common goals to treat the well-being of the whole person
[31]; and 3) require an initial education or training session
to teach the skills to participants before they can then
continue practicing the skills on their own, and some-
times, with the help of tools or devices (i.e., biofeedback
device, videotapes). An example would be a person
attending yoga classes to learn the practice, and then
practicing yoga on their own.

Study Eligibility Criteria

The PMTF Report 2010 dedicates a specific section to
complementary and integrative pain treatment medicine
with the objective to incorporate integrative therapeutic
modalities into a patient-centered plan of care. To develop
the most comprehensive list of ACT-CIM practices that fit
the scope of the review, the authors included 1) all active
Tier I and Tier II CIM modalities listed in the PMTF report
[3], with the exception of massage with a partner as this
does not fit the review’s definition of self-care; and 2)
additional CIM modalities, as defined by MEDLINE
Medical Subject Headings (MeSH) terminology, that could
be performed on one’s own.

The authors consulted SMEs, the PMTF, as well as MeSH
terminology to determine the most meaningful way to
categorize the self-care modalities yielded from the search
and to ensure that this review included the most compre-
hensive list of modalities. Figure 1 shows those modalities
identified by the PMTF, MEDLINE MeSH terminology, both
PMTF and MEDLINE MeSH, as well as by the authors
themselves, and demonstrates how the authors catego-
rized these modalities into larger groups for purposes of
this review (see Results section for more details).

The authors included articles if they met all of the following
criteria: 1) a population experiencing chronic pain symp-
toms, as defined above; 2) interventions that are reported in
the literature as either (i) an active self-care CIM practice or
(ii) a multimodal integrative self-care practice including all
self-care components, with at least one self-care CIM
component; 3) randomized controlled clinical trial study
design; and 4) at least one relevant pain outcome related to
chronic pain symptoms (i.e., pain intensity or pain severity).

Further, while some CIM modalities are primarily depen-
dent on practitioners (i.e., reiki, acupuncture, therapeutic
touch, massage, hypnosis), many do have the capacity to
become self-directed after an initial training, and as such,
are considered ACT-CIM practices if they were described
as such by the authors of the individual reports. Conse-
quently, articles were only included if they either 1) spe-
ified these were self-care modalities (i.e., self-reiki,
self-therapeutic touch, acupressure, self-massage, self-
hypnosis); or 2) consisted of an education or training
program in which participants were taught how to use
these modalities, continued to practice the modalities on
their own, and then had their pain assessed after they had
been practicing on their own.

The authors excluded articles if they met at least one of the
following criteria: 1) population not experiencing chronic
pain, as defined above; 2) intervention is not self-care and
is fully reliant on a practitioner (i.e., acupuncture); 3) inter-
vention is not a CIM modality (e.g., exercise, cognitive
behavioral therapy); 4) intervention is passive and does not
require active participation by an individual (e.g., ingestion
of any substance such as dietary supplements or herbs);
5) multimodal program that either (i) includes some com-
ponents that are not self-care or (ii) is exclusively self-care
but does not include at least one self-care CIM practice; 6)
study design other than randomized controlled trial (RCT);
and 7) no assessment of pain intensity or severity.

Data Sources and Search Strategy

Authors searched databases including PubMed, Ameri-
can College of Physicians, Cumulative Index to Nursing
and Allied Health Literature, PsycInfo, and Embase from
inception to June 2012. Authors explored MeSH within
MEDLINE and consulted with SMEs to determine the best
key words for the most powerful search (see Figure 2 for
PubMed search string). Variations of the search strategy
for the remaining databases are available upon request
from the primary author.

Traditional REAL methodology does not “exhaustively”
search the literature by including gray and non-English
language literature, instead only considering peer-
reviewed, English-language RCT and systematic review
study designs accessible in current English electronic
databases. Consequently, all searches were limited to
RCTs published in the English language and involving
human subjects. Authors manually used these criteria
to screen articles found in databases without these limit
options. There were no systematic reviews that fit the
inclusion criteria upon initial screen.

Study Selection

Using the predefined study eligibility criteria, two pairs of
investigators (LX and JS, and MS and NB) independently
screened titles and abstracts of the citations yielded from
the literature search. All investigators were fully trained in
the REAL methodology. Rulebooks detailing screening
tand review methodology are standardly used across all
REALs conducted at Samueli Institute to ensure objectivity
and consistency in reporting across all reviewers. All inves-
tigators were trained in the usage of these rulebooks at
each phase of the review. A Cohen’s kappa for inter-rater
agreement of 0.90 was maintained throughout the entire
screening phase. Disagreements about inclusion were resolved either through discussion and consensus, or by one of the review managers or SMEs. All articles marked for inclusion progressed to the review phase, during which the full-text articles were obtained to assess quality and conduct data extraction.

**Data Extraction**

Methodological quality was independently assessed by two reviewers (LX and JS) using the Scottish Intercollegiate Guidelines Network (SIGN) 50 Checklist for RCTs, a validated and reliable assessment tool widely used in the literature [32]. Both reviewers reviewed an initial selection of articles together until a sufficient kappa (>90%) was achieved at the review phase, at which point, they reviewed the remaining articles independently. All disagreements were resolved, either through discussion and consensus, or by the review managers with the SMEs. A full description of the SIGN criteria used to evaluate each of the included studies can be found in Table 1.

Figure 1 Active self-care complementary and integrative medicine (ACT-CIM) modalities included in the review.
The following descriptive data were also extracted during the review phase for all studies included in the review: pain condition, sample entered/completed, intervention and control description and dosage, relevant pain measures and corresponding results and statistics, and author’s main conclusions. The authors also noted whether power calculations to achieve sufficient effect sizes, and adverse events were reported.

Data Synthesis and Analysis

Total effect size was not calculated due to the heterogeneity of the included studies. Instead, the overall literature pool was assessed to develop recommendations for self-care practices for pain management. All assessments were based on information provided in the published studies that met the inclusion criteria and followed a modified version of the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) methodology [33], an internationally accepted, widely used, and transparent approach to grading the quality of evidence and strength of recommendations across studies.

A team of nine SMEs was assembled to perform the GRADE analysis. All SMEs were carefully chosen for their

Table 1. SIGN 50 [32] checklist for randomized controlled trial study designs

<table>
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<th>Section 1. Internal Validity*</th>
<th>Criteria</th>
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<tr>
<td>Item†</td>
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<tr>
<td>1.1</td>
<td>The study addresses appropriate and clearly focused question.</td>
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<tr>
<td>1.2</td>
<td>The assignment of subjects to treatment groups is randomized.</td>
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<td>1.3</td>
<td>An adequate concealment method is used.</td>
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<tr>
<td>1.5</td>
<td>The treatment and control groups are similar at the start of the trial.</td>
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<tr>
<td>1.7</td>
<td>All relevant outcomes are measured in a standard, valid, and reliable way.</td>
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<tr>
<td>1.8</td>
<td>What percentage of subjects in each treatment arm dropped out before the study was completed?</td>
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<tr>
<td>1.9</td>
<td>All subjects are analyzed in the groups to which they were randomly allocated (intention-to-treat analysis).</td>
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<tr>
<td>1.10</td>
<td>Where the study is carried out at more than one site, results are comparable for all sites.</td>
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<th>Section 2. Overall Assessment</th>
<th>Criteria</th>
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<tr>
<td>Quality score</td>
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<tr>
<td>++</td>
<td>All or most of the criteria have been fulfilled adequately or well (0 poorly addressed criteria). Where they have not been fulfilled, the conclusions of the study are thought very unlikely to alter.</td>
</tr>
<tr>
<td>+</td>
<td>Some of the criteria have been fulfilled adequately or well (1–2 poorly addressed criteria). Those criteria that have not been fulfilled or not adequately described are thought unlikely to alter the conclusions.</td>
</tr>
<tr>
<td>−</td>
<td>Few or no criteria fulfilled adequately or well (3 or more poorly addressed criteria). The conclusions of the study are thought likely or very likely to alter.</td>
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SIGN = Scottish Intercollegiate Guidelines Network.

* Each item is evaluated as well covered, adequately addressed, or poorly addressed. Item 1.10 can also be marked as not applicable.

† Items 1.4 and 1.6, regarding blinding and treatment differences, respectively, were not assessed as these items were not applicable to the complementary and integrative methods being assessed. SIGN criteria was subsequently modified and weighted accordingly because of this.
expertise in the area of chronic pain and represented a diverse group from various backgrounds. All SMEs were trained in how to objectively perform the GRADE analysis using a rulebook detailing specific GRADE criteria. SMEs then independently examined the data extracted during the review phase in order to: 1) examine the magnitude of the effect; 2) determine the confidence in the estimate of the effect; 3) assign an overall and reported safety grade; and 4) provide an overall recommendation for the intervention as well as identify the research gaps in the literature that emerged from the review; each modality was graded by two SMEs to ensure reliability. Once the independent analyses were completed, the review managers collected the scores and produced a summary report of all the SMEs’ scores for each of the modalities.

**Expert Roundtable and Recommendation Consensus Building**

The SMEs and Samueli Institute were convened as a working group at a 1-day meeting to 1) review the summary of all the independent scoring across all modalities included in the review; 2) come to consensus regarding their GRADE analyses; 3) discuss strengths, weaknesses, and safety concerns for each modality graded; 4) rank each modality according to the strength of the evidence and state of the science for ACT-CIM modalities for chronic pain management; 5) identify gap areas in the current literature; and 6) discuss recommendations for, and challenges and barriers to operationalizing and implementing the ACT-CIM approaches identified as most promising for chronic pain management. Overall recommendations are reported in another article [47] within this *Pain Medicine* supplement.

**Results**

The initial search yielded 2,771 citations from database inception to June 2012. After screening for inclusion criteria, 149 articles were included in the full review. Of these, six articles [35–40] reported on different outcomes of the same study and were therefore combined (i.e., six articles reporting on three different studies). Consequently, a final total of 146 articles were included in this review. There were no systematic reviews/meta-analyses that fit the inclusion criteria. See Figure 3 for the flow chart of studies throughout the various levels of the review.

The remaining articles in this supplemental issue detail the full results of the REAL and GRADE analysis for each modality included in the review. For the purposes of structuring this current *Pain Medicine* supplement into individual articles, the authors chose to group the modalities into specific categories based on the PMTF definitions, as well as MeSH definitions (see Figure 1). Specific results of studies assessed as mind–body therapies [41], movement therapies [42], physically oriented therapies [43], sensory art therapies [44], multimodal integrative approaches [45], and studies directly comparing self-care approaches [46] to one another are detailed in subsequent articles in this supplemental issue. Each of the results chapters will describe how the authors of this review have categorized the studies and detail full results of the review, GRADE analysis, and SME recommendations.

Table 2 details the specific categories of modalities found in the literature according to the review’s analysis, the number of those reporting statistically significant results for self-management of chronic pain symptoms, and the overall methodological quality assigned using the SIGN 50 criteria for each of the categories of studies collected and assessed.

**Discussion**

**Strengths and Limitations**

This review did have some limitations that the authors feel are necessary to point out. First, the authors chose to solely look at “chronic pain” rather than “acute pain” for this review. Because the authors were interested in determining which ACT-CIM therapies affected symptoms (i.e., pain severity/intensity) experienced by all populations characterized as “chronic pain” sufferers, the authors felt it was appropriate to combine specific chronic pain populations in order to generalize the value of active self-care modalities for managing such symptoms, regardless of the pain condition.

The etiology of pain is multimodal and complicated. Consequently, identifying ACT-CIM therapies to address this pain can be independent of the specific chronic pain condition or population. The authors provide a brief analysis stratifying the included studies by chronic pain condition instead of the specific self-care modality in a another article [47] within this supplemental issue. The authors believe that offering a preliminary analysis of the evidence base of the current literature by modality, rather than condition, is the first step toward understanding if these modalities affect chronic pain, as measured by pain severity or pain intensity symptoms. This step will then serve as a foundation upon which more research, regarding how these ACT-CIM modalities affect specific conditions, can be conducted. Future research should begin to dissect the impact of self-care modalities on not only other aspects of pain (e.g., medication usage, sleep disturbances, psychosocial factors) but also pain-related symptoms specific to particular pain populations (e.g., functionality in arthritis patients).

Second, although restricting the review’s search strategy to systematic reviews and RCTs published in the English language may be seen as a limitation, the authors do not believe doing so compromised the review in any way. In fact, while conventional systematic reviews consider the inclusion of only English-language studies as a limitation, research shows this does not seriously affect the outcome or implication for the majority of interventions and claims [48,49]. While including gray literature allows for a reduction of publication bias, it can also result in the overestimation of an intervention’s effects as unpublished studies.
are usually of lower quality, more difficult to find, and include smaller sample sizes compared with studies that are published in the English-language literature [50,51]. Because the authors wanted to survey the most robust study designs available, they focused solely on these study designs in order to provide a focused quality snapshot of the current available literature base. Further, as displayed in Table 2, there were some ACT-CIM modalities for which no studies meeting the review’s inclusion criteria were found. This does not necessarily mean that these approaches should be disregarded. Instead, the authors encourage researchers and clinicians to evaluate these modalities using the quality research parameters described throughout this supplemental issue to support incorporation of these treatments into standard pain care. For example, at the time of the review, no studies on self-care therapeutic medical massage had been published in the peer-review literature; however, the first study [52] has just recently been published. Consequently, the possibility of a particular modality being an effective self-care tool for chronic pain management should not be dismissed due to a lack of included studies. Rather, this lack of studies should encourage readers to be aware that more studies are needed in this area in order to definitively accept or reject these modalities as effective treatments.

Lastly, analyses of the literature were limited by the GRADE methodology employed to synthesize the literature. Although the GRADE is widely used and well accepted, detailing specific criteria to guide graders in their analyses, it is still quite subjective. It also heavily relies on effect size and safety reporting, as described by the authors of the studies included in the review. Several studies did not report effect sizes, and as such, the authors could not comment on the magnitude of the effect size across these studies without employing a meta-analysis technique. Similarly, safety is graded based only on studies that reported or mentioned adverse events. Due to the overwhelming lack of safety reporting across studies included in this review, the authors were unable to comment on safety, and subsequently, for many of the modalities, were not able to provide a full GRADE

Figure 3 Flow chart of all studies included in the review.
recommendation. Future research should emphasize reporting both effect size and safety in all publications, so that readers may obtain a clearer picture of the effectiveness and relative risks and benefits of particular modalities.

Despite these limitations, the authors believe that this review offers insight into not only the complexity of assessing chronic pain but also various modalities that can be used for the self-management of pain. As such, they provide overall recommendations for future research stemming from this review in a subsequent article [34]. The authors hope that this contribution to the field, discussed throughout this Pain Medicine supplement, will offer researchers and clinicians the first step toward providing recommendations for the use of ACT-CIM therapies for chronic pain management.

**Conclusion**

The complexity of chronic pain calls for a holistic and biopsychosocial model that acknowledges the individual...
as a whole within the context of biological, psychological, and social/cultural factors by establishing a more patient-centered approach [17,18] that incorporates and integrates active self-care therapies as part of the course of treatment.

As a response to this growing need for an effective treatment model that adequately addresses the multiplicity of chronic pain comorbidities, specialized, interdisciplinary pain management centers now exist. Although such centers are “interdisciplinary” in that they encourage the synergistic cooperation between and among practitioners toward one same goal [53–55], they often differ in the types of modalities offered based on their population, available efficacy evidence, and treatment goals. Truly, interdisciplinary programs incorporate ACT-CIM modalities as primary program components. Implementation of such programs, however, is limited by several factors such as availability of medical personnel and highly specialized ACT-CIM practitioners, credentialing procedures, allocation of resources, remuneration for these services, attitudes and beliefs of key personnel responsible for the initiative, and lack of evidence regarding the effectiveness and feasibility of modalities included in the programs. This lack of evidence significantly affects the clinicians’ ability to develop best practices for integrative pain management.

As such, this supplemental issue assesses the existing evidence, identifies research gaps, and provides next steps toward establishing a foundation upon which sound recommendations can be made in order to facilitate the desired change toward a more integrative approach for chronic pain management.

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