2009

Effectiveness of Mind Body Interventions for Adults with Chronic Pain

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Disciplines
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Effectiveness of Mind Body Interventions for Adults with Chronic Pain

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Date: November 16, 2009

CLINICAL SCENARIO:

Chronic pain is a growing issue, as medical intervention allows people to live longer and to survive more serious injury. Reduced function due to chronic pain can lead to isolation, occupational deprivation, depression, and lowered quality of life, among other negative effects.

Occupational Therapists are interested in knowing what evidence exists for non-pharmaceutical mind-body interventions that they may teach or recommend which would ultimately result in increased participation in areas of occupations. Therapists also seek to find non-invasive coping techniques in addition to behavioral medicine to buffer the negative effects of pain.

When considering so called “mind-body” practices, the future of OT and mind body medicine seem inexorably linked: National Center for Complementary and Alternative Medicine defines mind–body medicine in the following way:

“Mind-body medicine focuses on the interactions among the brain, mind, body, and behavior, and the powerful ways in which emotional, mental, social, spiritual, and behavioral factors can directly affect health. It regards as fundamental an approach that respects and enhances each person’s capacity for self-knowledge and self-care, and it emphasizes techniques that are grounded in this approach.”

With these ideals related to self-care, participation, quality of life, and multiple influences of the person on overall sense of health, as well as its roots in the mind-body connection, occupational therapy is uniquely poised to integrate mind-body interventions as best practice.

FOCUSED CLINICAL QUESTION:
What is the evidence for the effect of non-pharmaceutical mind-body interventions on chronic pain in adults?

SUMMARY of Search, ‘Best’ Evidence’ appraised, and Key Findings:

- A structured review of mind-body interventions for older adults with chronic non-malignant pain (Morone, Greco, 2007) evaluated pain reduction, feasibility, and safety in 20 different studies. They discovered few controlled trials, small sample sizes, and lack of a
comparison group. Overall findings are indicative of the relative infancy of the field of mind-body medicine and the review recommended more extensive, strongly designed studies with control groups and larger sample sizes to further prove efficacy with a stronger effect size. Interestingly, mindfulness meditation resulted in greater pain acceptance and improvement in physical function, but not a change in pain measure, leading one to question not only whether or not there is a benefit but more specifically how particular treatments are of benefit.

- A review specifically focused on research for meditation as a treatment in chronic pain was the first review to focus on the pain population and meditation (Teixeira, 2008). 9 of the 10 studies which met the search criteria were specifically focused on Mindfulness Based Stress Reduction (MBSR) intervention, which shifted the focus of the review. Significant findings include less sadness, and some studies showed decreased pain levels but not all. In other studies, mental health measures improved significantly even when pain did not. Other benefits included improvements on coping, mental health, pain acceptance, and overall quality of life even if pain intensity did not change.

- Analysis of diaries kept by participants in a mindfulness meditation-based program for chronic low-back pain (Morone, Lynch, Greco, Tindle, & Weiner, 2008) revealed not only pain reduction, but some very positive additional results of decreased stress, including improved memory, and improved decision making – very functional outcomes from an OT perspective.

- A survey (Brown, 2003) of service users’ (pain patients) and occupational therapists’ beliefs about pain treatment unveiled some distinct differences (p<0.000) between the groups regarding beliefs about the locus of control of pain. When measured along the following pain belief subscales, patients identified pain is most controlled by chance, followed by doctors, then finally internal control. Conversely, OTs believe internal control is most important, followed by chance, then finally doctors. The differences in beliefs can easily be seen to influence treatment and effectiveness of treatment of chronic pain.

- A promising pilot study examining the efficacy of meditation combined with cognitive behavioral therapy for veterans with PTSD showed evidence of “curing” PTSD with this combined intervention (Otis, Keane, Kerns, Monson, Scioli, 2009) – exciting results on a growing population in need, however the small sample size (N=3) prevents us from drawing clinical significance from this study.

**CLINICAL BOTTOM LINE:**
Chronic pain can have a devastating effect on clients, leading It is critical that we utilize interventions which allow chronic pain clients to cope. Thus far, meditation among several other mind-body interventions are a clinician’s most proven intervention but no one treatment has been established as the best practice. We still need to know which intervention works with which client, and what length of treatment duration creates an effect. It is also important to capture the right outcome, for example, if quality of life is improved and functional limitation reduced, consider that a successful intervention regardless of the pain scale. If the intervention is safe and feasible and leads to increased function, and if it is for the overall “greater good” of the individual experiencing the pain, it may be worth the cost of treatment.
Limitation of this CAT:  This critically appraised topic has only been reviewed by the author; each paper was read multiple times by the author for in-depth understanding. Author does not claim to be an expert on this topic.

SEARCH STRATEGY:

Terms used to guide Search Strategy:

- **Patient/Client Group:** Adults with Chronic Pain
- **Intervention (or Assessment):** Meditation and other non-pharmaceutical interventions
- **Comparison:** Absence of alternative treatment: control group or “traditional” pain interventions (meds, M.D., etc)
- **Outcome(s):** Reduced perception of pain, increased functional capacity, increased quality of life

<table>
<thead>
<tr>
<th>Databases and sites searched</th>
<th>Search Terms</th>
<th>Limits used</th>
</tr>
</thead>
<tbody>
<tr>
<td>CINAHL Cochrane Systematic Reviews PsycInfo Medline</td>
<td>Chronic pain Intervention Meditation Mindfulness Based Stress Reduction Occupational Therapy Systematic Review</td>
<td>-Children, -Older than 2001 -Acute pain -English only</td>
</tr>
</tbody>
</table>

INCLUSION and EXCLUSION CRITERIA

- **Inclusion:** chronic pain + intervention, chronic pain + meditation, chronic pain + complementary alternative medicine, reference review from search results, peer reviewed, adults, older adults, recent (last 8 years)
- **Exclusion:** children, adolescents, levels V & VI, non-intervention, studies prior to 2001

RESULTS OF SEARCH
Five relevant studies were located and categorised as shown in Table 1 (based on Levels of Evidence, Centre for Evidence Based Medicine, 1998)

**Table 1: Summary of Study Designs of Articles retrieved**

<table>
<thead>
<tr>
<th>Study Design/ Methodology of Articles Retrieved</th>
<th>Level</th>
<th>Number Located</th>
<th>Author (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systematic Review</td>
<td>I</td>
<td>2</td>
<td>Morone (2007)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Teixeira (2008)</td>
</tr>
<tr>
<td>Cross Sectional</td>
<td>II</td>
<td>1</td>
<td>Brown (2003)</td>
</tr>
<tr>
<td>Before and After - Pilot</td>
<td>IV</td>
<td>1</td>
<td>Otis (2009)</td>
</tr>
<tr>
<td>Qualitative Grounded Theory</td>
<td>N/A</td>
<td>1</td>
<td>Morone (2008)</td>
</tr>
</tbody>
</table>

**BEST EVIDENCE**

The following study/paper was identified as the ‘best’ evidence and selected for critical appraisal. Reasons for selecting this study were:

- Systematic review
- Comprehensive review of mind-body therapy as a whole on a scope not yet seen in the literature
- Careful analysis of each study presented in a detailed table

**SUMMARY OF BEST EVIDENCE**

**Table 2:** Description and appraisal of Mind-body interventions for chronic pain in older adults by Morone & Greco, 2007.

**Aim/Objective of the Study/Systematic Review:**

**Study Design/Search Strategy:**

MEDLINE (1966–March 2006), PsycINFO (1967–March 2006), AMED (1985–March 2006), and CINAHL (1982–March 2006) databases were searched. Search terms used were: mind–body and relaxation techniques, biofeedback, progressive muscle relaxation, meditation, mindfulness meditation, mindfulness, transcendental meditation, guided imagery, hypnosis, tai chi, tai ji, chi gong, yoga, aged, pain, persistent pain, pain
intractable, chronic disease, and older adults or older. The reference lists of retrieved articles were also manually reviewed. Articles of randomized controlled clinical trials or uncontrolled clinical trials of older adults with chronic nonmalignant pain published in the English language were included.

Articles were excluded if they: (1) did not study chronic nonmalignant pain; (2) were not published in English; (3) were not intervention trials; (4) were review or theoretical articles (e.g., not a primary study); and (5) did not include any older adults. Originally intended to include only those studies with adults 65 years of age and older, however, this was too exclusive, so younger adult populations were also reviewed. “Gray” literature, such as abstracts, or other unpublished materials, such as dissertations, was excluded.

Setting: Location was not specified for the 20 studies in the review, though their search criteria would lead one to believe it is a geographically diverse English-speaking population

Participants: (N, diagnosis, eligibility criteria, how recruited, type of sample (eg purposive, random), key demographics such as mean age, gender, duration of illness/disease, and if groups in an RCT were comparable at baseline on key demographic variables; number of dropouts if relevant, number available for follow-up)

Intervention Investigated (provide details of methods, who provided treatment, when and where, how many hours of treatment provided)

Control: Absence of mind-body treatment (if control group present, control group not present in all studies)

Experimental: Biofeedback, progressive muscle relaxation, meditation, guidedimagery, hypnosis, tai chi, qi gong, and yoga. Describe ranges of tx duration, etc.

Outcome Measures
Outcome measures varied by study, but included the following: Arthritis Impact Measurement Scales, biofeedback, Center for Epidemiologic Studies Depression scale, Chronic Pain Acceptance Questionnaire, Electromyographic, Health Promoting Lifestyle Profile, Life Staisfaction Index, McGill Pain Questionnaire, O Short Form 36 item Health Survey, Symtome Checklist 90-Revised, General Severity Index, Visual Analog Scale, Beck Anxiety Inventory, CGeriatric Depression Scale, Roland Disability Scale, State Trait Anxiety Inventory

Main Findings: (see Table 1, 3 page chart of scores) Showed a variety of results from high, medium, and low graded studies, whether studies had any change due to intervention. A well-organized table presented data including design, condition, intervention, length of exposure, outcome measures, pain effect size, quality grade, and notes regarding each study.
A major issue of the research in this field becomes apparent when examining design quality. Of 20 studies reviewed, here is the “quality grade” breakdown:
- 8 very low quality
- 5 low quality
- 5 moderate quality
- 1 high quality
- 1 ungraded

**Original Authors’ Conclusions**
“There is some support for the efficacy of progressive muscle relaxation plus guided imagery for osteoarthritis pain. There is limited support for meditation and tai chi for improving function or coping in older adults with low back pain or osteoarthritis. In an uncontrolled biofeedback trial that stratified by age group, both older and younger adults had significant reductions in pain following the intervention. Several studies included older adults, but did not analyze benefits by age. Tai chi, yoga, hypnosis, and progressive muscle relaxation were significantly associated with pain reduction in these studies.” (pg. 359)

**Critical Appraisal:**

**Validity**
Many of the details of selection and rigor from the original 20 studies were not described in the review study, limiting analysis that could be performed for each individual paper.

Attention bias: only one of 20 studies included an intention-control group.

**Interpretation of Results**
Small sample sizes hampered effect sizes throughout the studies analyzed in this review. Lack of a control group was also limiting in many studies. No one way of measurement seems to be agreed upon for all studies.

**Summary/Conclusion:**
“Because of the current scarcity of randomized controlled trials in this area, conclusions regarding the efficacy of mind–body therapies for chronic pain in the older adult must be tentative. Based on this review, there is some support for the efficacy of relaxation for reducing pain of osteoarthritis, and limited support for meditation and tai chi for improving function or coping for chronic low back pain or osteoarthritis, respectively.”

**Table x: Characteristics of included studies**

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<thead>
<tr>
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<tbody>
<tr>
<td>Past pain interventions,</td>
<td></td>
<td>Various mind-body</td>
<td>Mindfulness Meditation</td>
</tr>
<tr>
<td>Comparison intervention</td>
<td>Population: OT vs. Pain pts</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------------------------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>Outcomes used</td>
<td>Pain scale, Listing interventions</td>
<td>Pain acceptance, physical fx, pain scale</td>
<td>Themes collected through diary analysis</td>
</tr>
<tr>
<td>Findings</td>
<td>Pain pts believe Dr. Has control, OTs believe p. is internally controlled</td>
<td>Mindfulness meditation worked best, improving pain acceptance &amp; fx, but NOT pain rating</td>
<td>Pain reduction, Improved memory, decision-making, decreased stress</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intervention investigated</th>
<th>Meditation &amp; CBT for PTSD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparison intervention</td>
<td>None</td>
</tr>
<tr>
<td>Outcomes used</td>
<td>PTSD scale</td>
</tr>
<tr>
<td>Findings</td>
<td>PTSD “cured”</td>
</tr>
</tbody>
</table>

**IMPLICATIONS FOR PRACTICE, EDUCATION and FUTURE RESEARCH**

This reviewer’s experience started as an exploration of the efficacy of meditation as an OT treatment, however expanded to the realization that what applies for many other aspects of OT also applies to meditation and other mind-body interventions: the solution may not lie in one cookie cutter approach. Myriad alternative therapies may be such individualized solutions that efficacy cannot be proven without larger more robust studies that analyze results by population. Compounded by this dilemma is the phenomenon of chronic pain itself, which is such an individualized experience that proving effectiveness for one treatment may also be difficult to pinpoint. Is it that the interventions in questions “don’t work” or that certain interventions are only effective for certain people?

The encouraging news, however, is that since these alternative therapies do fall within the scope of OT practice, and many are feasible and safe for participants to attempt, a broad range individualized approach using a combination of alternative therapies may spark upon which one works for a given individual. However, as always, funding may limit such an experimental “grab bag” approach to intervention.

It is clear from the diversity in methods used to measure effects of pain that further research on the validity of various pain measures continue, otherwise outcome measures are like comparing apples and oranges.

Implementing this intervention is a low-cost proposition from a clinical standpoint – no equipment required. Therapists may theoretically pursue a personal or professional development interest to obtain full-blown MBSR certification (still relatively low cost) or the intervention could be implemented on a more casual basis just through informal online or self-training, a lower barrier to entry cost-wise, but not necessarily as valid.
The newest research results in the informal press seem promising, given health care’s time-driven environment: recent findings show decreased pain sensation with only limited meditation training, a more feasible intervention than the customary 8-week mindfulness based stress reduction program (University of North Carolina at Charlotte, 2009.)

REFERENCES


