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|  | **Student: Marian Thomas Sudano**  **Question: Is physical therapy with pain coping strategies improve pain outcomes in patients with knee osteoarthritis better than standard physical therapy alone?** | | | | | | **Date: 02/12/16**  **Search: PubMed, Cochrane, CINAHL** | |
| **Author/ Year** | | **Level of Evidence/Design** | **Purpose/ Subjects** | **Intervention or description** | **Measurements** | **Outcomes** | | **Comments**  **/limitations** |
| Broderick et al.; 2014 | | Level 1b,  PEDro: 8/11  **Design:** Randomized Controlled Trial | **Purpose:** To determine if NP delivered pain coping skills training (PCST) resulted in decreased pain, improved function, QOL and self efficacy in patients with chronic OA pain when compared to usual care  **Subjects:**  n = 129 (intervention)  n=127 (control) | **Intervention:** 10 individual weekly sessions of 30 – 45 minutes of cognitive/behavioral training to change pain perception and improve pain control led by NP. Coping strategies included:   * Relaxation response * Attention diversion * Altering activity/rest patterns * Reduce negative pain thought patterns   **Control:** Continue with usual care, subjects provided with OA information packet and community exercise resources/support groups | Arthritis Impact Measurement Scale  Brief Pain Inventory  WOMAC  Coping Strategies Questionnaire  7 days of End of Day Voice Recordings for pain intensity, social function and interference of pain in daily life | Significant improvement in intervention group for: pain intensity, physical functioning, psychological distress, use of pain coping strategies, catastrophizing, fatigue and overall satisfaction with health at post-treatment, 6 month and 12 month follow up. Intervention group reported decreased need for medication for pain.  Self-efficacy improvement was not maintained at 12-month follow up. | | Overall effect sizes for each treatment were small ( < 0.3)  Only 81% of participants completed all 10 sessions; higher adherence to session attendance was correlated with increased improvement |
| Coleman et al.; 2012 | | Level 1b, PEDro: 8/11  **Design:** Randomized Controlled Trial | **Purpose:** To determine if a self management program specific to knee OA delivered by healthcare professionals would result in improved health-related outcomes in patients with knee OA compared to a control  **Subjects:**  n = 75 (intervention)  n = 71 (control) | **Intervention:** OAK program -Weekly group meetings (6 weekly session, 2.5 hours) led by a healthcare professional (PT, OT or nurse) that is based on goal setting, problem solving and guided imagery. Provides information about exercise, pain management techniques, medications and general information about knee OA.  **Control:** Did not receive any self management training | WOMAC – health status  SF-36 – Quality of Life | Significant improvement in OAK group for pain, physical function stiffness on WOMAC after 8 weeks, but was not sustained after 6 months.  Significant difference for physical function, body pain, vitality, social function and physical role after 8 weeks, but sustained significant effect for physical function and body pain after 6 months for OAK intervention  Significant difference noted in TUG scores of intervention compared to control | | Unclear if patients in either group were receiving concurrent medical treatment along with intervention  Difference in knee OA body pain severity in OAK group, difference in overall WOMAC pain outcome in control group at baseline measurements |
| Hunt et al.; 2013 | | Level 2b,  PEDro: 8/11  **Design:**  Randomized Controll Trial | **Purpose:** This was a pilot study to determine if a larger RCT that examined physical therapy combined exercise and pain coping strategies (PCST) compared to PT only would be warranted  N= 10 (intervention)  N = 10 (control) | **Intervention**: Exercise program (walking, LE strengthening) with PCST for 10 weeks (1 in person, 60 minute session, HEP and coping strategy task performed independently 3x a week)  **Control**: Exercise program and provided with non direct counseling during treatment sessions (10 weeks, 1x week). Not required to complete HEP program | Arthritis Self Efficacy Scale  Step Test  WOMAC  Isometric quad/hamstring strength at 60 | Only coping strategy use was significantly different between the groups after 10 weeks  Both groups improved on WOMAC and Arthritis Self Efficacy Scale | | Larger RCT would require at least 63 participants for sufficient power to detect meaningful change  Study therapists were involved with providing PCST and PT, may have influenced outcomes with researcher bias |
| Kao et al., 2012 | | Level 2b,  PEDro score: 5/11  **Design:**  Cohort study | **Purpose:** To evaluate the effect of a TOAP intervention based on social cognitive theory on | **Intervention**: Four 80 minute classes that included a 20 lesson on self efficacy/pain management, 20 minutes exercise and 40 minutes discussion. Groups were led by a PT trained in TOAP principles and met 1x/week  **Control**: Performed normal routine care | Physical Component of Health Related Quality of Life  Mental Component of HRQOL  WOMAC | Significant differences found between groups only for physical functioning measure from baseline to 12 weeks  Significant decline in physical functioning in intervention group from baseline to post intervention, 12 month follow up for physical functioning when compared to control | | Clustered randomization occurred based on where patients lived  No X-ray determined diagnosis of knee OA |
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| Kroon, FPB et al. | | Level I Evidence, included RCTs and quasi-randomized studies  **Design:**  Systematic Review | **Purpose:** To determine the effect of a self management program on patients with knee OA on function, pain and coping strategy use when compared to usual care, other interventions, attention control or information alone  N = 6,753; 29 studies included, patients with both hip and knee OA | **Intervention**: Self management programs in conjunction with standard medical care  **Control**:  Attention control (5)  **Another intervention (PT included)** (7),  Information alone (4)  Standard care (17) | Arthritis Self Efficacy Scale  Pain  AIMS 2 – Global Arthritis Scale  Self Reported Function  Quality of Life  Withdrawals from studies | Moderate evidence supports minimal absolute improvements (<5%) for quality of life, self reported function, global OA, pain, self management of OA for SMP compared to another intervention  Similar findings for SMP compared to usual care (from doctor) and to information only groups  When compared to attention control, no significant benefit found for any of outcomes after one year | | No trials reported adverse events  Evidence suggests that provider-patient quality of relationship affects outcomes  Other interventions included: acupuncture, physical therapy, social support, exercise |
| Bennell et al., 2015 | | Level Ib  PEDro Score: 9/11  **Design:** Randomized Controlled Study | **Purpose**: To compare the effects of a combined physical therapy and pain coping strategy training (PCST) to a physical therapy only group and a pain coping strategy only group on pain and physical function in patients with knee OA  N = 73 (PCST + PT)  N = 74 (PCST only)  N = 75 (exercise only) | Intervention: Participants went for 10 sessions with a physical therapist and received:   * PCST: 45 min   + Pain education and coping strategy training   + Daily coping strategies provided * Exercise: 25 min   + LE strengthening   + Daily HEP provided * PCST + Ex = 70 min   + Daily HEP and coping strategies provided | Physical function on WOMAC  VAS pain score within the past week  Overall cost effectiveness of interventions | At 12 weeks, significant difference in WOMAC function score when comparing PCST + EX to EX only or PCST only  At 32 weeks, combined group had significantly greater improvement in WOMAC function, walking pain when compared to exercise group.  Combined group had significantly greater improvement for WOMAC function and average pain when compared to PCST group only. | | Patients who were lost to follow up had less severe knee OA  Treatment Cost/Per Participant for 10 sessions:   * PCST + EX: $765 * EX: $315 * PCST: $523 * Combined group did not show greater cost effectiveness than other groups |
| Jessup et al. 2009 | | Level 2b evidence  PEDro Scale:8/11,  **Design:** Randomized Controlled Trial | **Purpose:** To determine if participation in the ESCAPE-Knee Pain program would result in better physical function and decreased healthcare utilization costs when compared to standard PT for patients with chronic knee pain  N = 29 (ESCAPE-Pain)  N = 35 (PT group) | **Intervention:** ESCAPE-Knee Pain is a group program that focuses on changing thought patterns, promoting exercise. Each session includes a 20 min informal group discussion of coping strategies and a 40 min progressive exercise program. 10 sessions were held twice a week for 5 weeks and led by a physical therapist. After the program, participants received a written exercise program and community fitness resources.  **Control:** 10 sessions at outpatient PT, based on PT’s discretion | Physical Function on WOMAC  Client Services Receipt Inventory – Measure of healthcare utilization  WOMAC – Pain scale | No significant difference between groups for primary outcomes at 12 month follow up  Intervention cost:  ESCAPE: $90.19  PT: $186.12  Healthcare Utilization:  ESCAPE: 366.56  PT: $452.20 | | Participants did not have an official diagnosis of knee OA, just chronic knee pain  Greater adherence in intervention compared to control; only 3 participants in PT group completed 7 or more sessions; 21 participants completed 3-6 sessions over the 5 weeks compared to 24 participants attending 8 or more ESCAPE sessions  Healthcare costs were based on patient recall, not actual figures |
| Hurley et al. 2007 | | Level 2b evidence, PEDro scale: 7/11  Design: RCT | **Purpose:** To determine if the ESCAPE-Knee Pain program combined with usual care resulted in better functioning when compared to patients who received usual primary care. Secondary hypothesis compared the effect on functioning for individual vs. group ESCAPE-Knee participation.  N = 140 (usual care)  N = 146 (usual care with individual rehab)  N = 132 (usual care with group rehab) | **Intervention**: Same as described above, except participants either received the intervention individually for 2x/week for 6 weeks or in an 8 person group for 6 weeks. Same PT used for all participants.  **Control**: Received usual care from PCP  Follow up at 6 weeks at end of intervention, 6 months post intervention | WOMAC - total function score  *Secondary:*  WOMAC - pain scale, functional performance | Patients who received the ESCAPE-Knee intervention (both individual and group) had significantly better functioning scores at at 6 weeks and 6 month follow up when compared to usual care.  No differences in function/pain found between individual vs. group arms | | Not as many participants were in the group intervention compared to other groups ( due to scheduling conflicts)  Only one PT provided treatment/ESCAPE Knee protocol, decreasing intervention delivery variation  Overall small effect sizes found: 0.29 for functioning, 0.27 for pain  Cluster sample - primary care practices, not actual participants were randomized which may have increased bias |
| Somers et al. 2012 | | Level 2b evidence  PEDro score: 9/11  Design: RCT | **Purpose:** To determine if a pain coping straetgy training (PCST) combined with a behavioral weight management program (BWM) would result in decreased pain, disability and weight compared to PCST alone, BWM alone or standard care.  N = 60 (PCST only)  N = 59 (BWM only)  N = 62 (PCST - BWM combined)  N = 51 (standard care) | **Intervention:** All led by clinical psychologists with training in each intervention    **PCST:** First 12 weeks included 1 hour sessions/1x week that included decreasing maladaptive pain coping and increasing positive pain coping strategies. For the last 12 weeks, sessions were held biweekly  **BWM:** 60 min group sessions held weekly and (3) 90 minute exercise sessions held weekly for the first 12 weeks. Last 12 weeks, group sessions held biweekly and no exercise classes.  **PCST + BWM**: 120 minutes sessions including the aboe interventions done each week, 3 90 minute exercise sessions included each week for the first 12 weeks. Done biweekly the last 12 weeks.  **Standard Care**: Received routine care | Arthritis Impact Measurement Scale (AIMS) - physical/psychological disability  WOMAC - function/pain  Gait velocity  Pain catastrophizing  Self efficacy  Weight/BMI | After 24 weeks, PCST + BWM significantly different for pain outcome when compared to BWM alone/standard care; but not when comapred to PCST only  Combined treatment resulted in significantly less disability, greater weight loss, greater levels of self efficacy and less pain catastrophizing when compared to all group | | All psychologists were trained by an experienced senior psychologist and video was taken of sessions in order to decrease intervention variability  Although the combined intervention had the best outcomes, it required a 3.5 commitment (120 min training, 90 min exercises) each week initially for 24 weeks, which may not be feasible in a PT setting  Community sampling recruited primarily people with college education, which may not represent entire population with knee OA |
| Rini et al., 2015 | | PEDro score: 8/11, Level of evidence: 1b  Design: RCT | **Purpose:** To determine if the effectiveness of a Web-based pain coping strategy program (PainCOACH) on reducing pain in patients with OA  N = 58 (PainCOACH)  N = 55 (Control, received assessment only) | **Intervention: Web-based**  **PainCOACH:** 8 week program with a 30-45 minute module completed each week that discussed a new positive coping strategy; individualized based on participant’s interaction with program  **Control:** Usual care, completed assessments at same time points | Primary: AIMS - 2: pain subscale  AIM-2: self-efficacy subscale  Pain Anxiety Symptoms Scale | No significant difference between groups for pain reduction; effect size: 0.33  Significant gender interaction - women experienced greater reduction in pain compared to control  Significant difference for improving self-efficacy in PainCOACH group; effect size: 0.43 | | Majority female participants in group; included patients with hip OA as well in the study  Did not have adequate power to determine significance (pilot study only)  Researchers provided a tablet to those who needed it, allowing all participants to access materials  Researchers used motivational interviewing techniques to improve adherence to PainCOACH program (91% completed it)  Researchers had a specific script to comply to for telephone and in person assessment, decreasing variability of assessment |
| Trudeau et al., 2015 | | PEDro score: 7/11;  Level of evidence: 1b  Design: RCT | **Purpose:** To determine if painACTION program would improve pain, increase function, improve positive cognition, reduce negative cognition and increase frequency of self-management behaviors in patients with varoius types of arthritis (OA, RA, fibromyalgia)  N = 124  N = 121 | **Intervention:** Access to painACTION intervention; participants asked to complete two 20 minute sessions online for 4 weeks; reduced to once a month over 5 months. Each sessions included information about a different self-management behavior. Intervention participants were required to do 8 site visits over 4 weeks, plus one visit over 5 months for assessment  **Control:** Usual care;Did not receive access to program; were not required to come in for assessment | Arthritis Self Efficacy Scale  Brief Pain Inventory - Short Form  Pain Severity subscale, Pain Interference subscale  Pain Catastrophizing Scale  Pain Awareness Scale | No significant difference in worst pain, pain severity or pain interference at either assessment time point  Significant improvement in self efficacy and use of coping strategies at baseline - 1 month, baseline - 6 month follow up with intervention group  Decreased pain catastrophizing compared to control | | Included patients with various types of arthritis pain which could have affected overall pain outcomes  Diagnosis was self-report, not validated by medical/physician record |
| Warsi et al., 2003 | | AMSTAR : 5/11  Level of evidence: 2a  Design: Meta-analysis | **Purpose:** To determine the effect size of a PCST education program for pain and disability in patients with arthritis (unspecified OA, RA, Polyarthritis) | Medline and HealthSTAR databases searched for self management/patient education programs for OA/RA and reviewed by 2 authors based on specific inclusion/exclusion criteria. Included articles that had an arthritis self management component, control group, and used pain/disability as an outcome | Effect size for arthritis pain and disability | Pain effect size: 0.12  Disability effect size: 0.07 | | Did not set what level of evidence they were searching for a priori  Established inclusion/exclusion analysis  Did not report heterogeneity; stated that the use of random-effects model of analysis accounted for increased heterogeneity  Performed a funnel plot for publication bias  Explained inclusion/exclusion criteria specifically  Included different types of arthritis diagnoses  Not primarily performed by PTs |

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**Summary/Synthesis: Try to answer or address your PICO question. In a couple of paragraphs (~ ½ page) summarize and synthesize what evidence you gather from your search. You may find a clear answer or may need to summarize/critique the research evidence to date.**

In general, arthritis self - management programs have been found to have a small clinical effect on pain (effect sizs = 0.12).12 Pain coping strategy programs alone within this population have been effective at improving self -efficacy and improving cognitions regarding pain, but do not have a direct, significant effect on pain severity.9,10,11  However, most of these programs were completed independently via the Internet and did not have in-person accountability. Although self-management interventions seemed to have a positive effect on physical function and pain, the effects were small and did not seem clinically meaningful when compared to physical therapy. However, it does seem that self-management does result in significantly greater improvement when compared to no treatment or providing information only. Group self-management programs (Kao et al., 2012 and Jessup et al. 2009) did not demonstrate significant results when compared to a control treatment, but both studies did have a high rate of patient adherence to sessions. Patient-provider relationship as well as adherence to the self-management intervention seemed to be correlated with better outcomes. The self-management interventions alone were found to be more cost effective than physical therapy or a combined PT and pain management treatment. All the health care professionals who were providing services were required to perform a specific training to teach the specific self-management program; however, this did not seem to increase overall cost of a self-management intervention. Overall, there is moderate evidence that indicates that a self-management program will have a small impact on patient function and pain outcomes when compared to physical therapy alone in the short term, but these effects are not sustained in the long term (i.e. > 6 months).

Nonetheless, as there were no adverse outcomes noted with this intervention, it seems like a valuable tool to include during a physical therapy session to help improve overall patient function. This intervention does have the potential to improve patient self-efficacy, which although does not directly decrease pain levels, could increase the use of positive coping behaviors.11 Implementation of education in clinical practice may be difficult given the time constraints (typically requires 1 hour sessions over 2 months); however, the use of an Internet - based modules may allow for patients to receive pain management education while receiving therapy.