**“Educate, Move, Empower: Yoga for Arthritis”**

A 10-Week Community-Based Therapeutic Yoga and Osteoarthritis Education Program.

I. Statement of Need

        Arthritis, affecting more than 50 million adults in the United States and the most common cause of disability for over the past 15 years according to Center for Disease Control and Prevention (CDC), accounts for over 100 rheumatic diseases and conditions.1, 3 In North Carolina alone, 28% of adults live with this disease.2 The CDC estimates the prevalence of the disease will increase to 67 million by 2030, an approximate 30% spike.2 Although arthritis affects all ages, elevated numbers are reported in the older population perhaps due to the increased lifetime risk from injury, obesity and effects of aginge.1 Approximately 30% of individuals in the U.S. between 45-64 years old, 50% of individuals between 65-74 years old, and 60% of adults 75 years or older have been diagnosed with arthritis.2

        The most common form of arthritis is osteoarthritis (OA), a condition that breaks down the protective articular cartilage in joints.3 The pain and inflammation caused by OA greatly affects one’s desire to move their body resulting in functional, physical activity and work-related limitations; as well as, psychological implications. The CDC reports 42% of individuals living with arthritis have activity limitations and 1 in 3 is unable to perform their job at full potential due to their diagnosis or even work at all.1  Additionally, the CDC states that arthritis is strongly correlated with major depression.1 This psychological burden coupled with the pain from moving perpetuates a vicious cycle of suffering and decreases quality of life in these individuals.1

        The sedentary lifestyle associated with OA can lead to comorbidities that create a great deal of financial burden on an individual level and within the healthcare system as a whole. 1, 3 Individuals with OA are at increased risk for developing metabolic syndrome, diabetes, and cardiovascular disease. 1, 3One million people are hospitalized for reasons related to OA yearly and it is the main contributing factor to costly joint replacements.1 Total medical costs of care and lost earnings due to this condition approximate an astonishing $128 billion annually.1,3

        Strong evidence exists suggesting that physical activity actually helps decrease the symptoms of OA and therefore the associated hardships; yet, many roadblocks exist to patient participation in physical activity.1,3 Engaging in moderate physical activity at least 3 times per week can reduce the risk of arthritis-related disability by 47%;1 however, it is a common misconception that physical activity will exacerbate OA symptoms and cause further joint damage.4 Additionally, many individuals mistakenly believe that OA is a normal part of aging and no treatment exists.4 Even further hindering interest and participation in physical activity are the limited number of affordable and safe treatments for OA.3 For example, a review of yoga and exercise classes offered in Orange County, NC reveal only a few classes geared towards students over 50 and none towards individuals with arthritis; this is not an uncommon finding. Lack of access to care and poor education about the basics of arthritis and effective prevention and treatment strategies is limiting outcomes and creating an unfavorable platform for this disease to increase in prevalence, severity and impact.

        These statistics about arthritis prevalence, impact of the disease on physical and psychological health, correlation with other major conditions and financial burden, limited access to care, expected growth of those affected by arthritis and many people succumbing to the common myths associated with physical activity and arthritis, highlight a need for effective prevention, self-management, affordable treatment and patient education.3 Structured exercise programs like yoga overlaid with pertinent education about OA are affordable, address physical and mental well-being and therefore can serve as a great tool to overcome the burdens of this disease, improve prognosis and overall quality of life. 5-7

II. Background

        Exercise, particularly strength training, patient education and self-management techniques in individuals with hip and knee OA decrease pain and improve physical function.8 Consequently, several healthcare initiatives and guidelines including the National Institute of Health and Clinical Excellence (NICE) and the American Academy of Orthopaedic Surgeons (AAOS) recommend self-management and education in addition to exercise as instrumental components of OA treatment and management.5,8,9

        Yoga, traditionally defined as union of the mind, body and spirit, is a form of physical activity.5 Bryan et al. found that a 10 week yoga course consisting of  two sessions a week resulted in a statistically significant increase in exercise adherence within the intervention group compared to the control group (P<0.12 and 0.004 respectively). The intervention group also had a statistically significant increase in general well-being (P<0.001) and qualitative analysis of data revealed self-reported improvements in exercise behavior, stress management and eating habits.5 In their 10 week yoga course Bryan et al. utilized breathing awareness, meditative practice and various yoga postures in a noncompetitive atmosphere that emphasized individualized practice.5  Additionally, researchers found that Iyengar Yoga, a form of yoga that focuses on alignment, posture and breathwork, has been used to reduce pain and stiffness and improve physical functions scores on the Western Ontario McMasters Arthritis Index (WOMAC),7 a standardized questionnaire used to evaluate the condition of individuals with arthritis.10

        Additionally, yoga increases self-efficacy using strategies outlined by Bandura’s model of self-efficacy.11 Bandura defines self-efficacy as an individual’s beliefs about their capabilities to produce designated levels of performance that influence events that affect their lives.11 In order to achieve high self-efficacy, Bandura proposes that an individual must master experiences, see people similar to themselves succeed and be persuaded verbally that they have the capabilities and knowledge to be successful.11

        In regards to therapeutic yoga for individuals with OA there are several gaps in the literature.  Potential factors for the lack of research include small sample size and limited interest in participation in yoga which may be the result of people’s misguided perception of yoga. The founders suggest that people often do not consider yoga a form of exercise and are intimidated by a potential relationship to religion. Additionally, the physical practiceof yoga comes in various forms; each form comprises its own set of postures and techniques making it challenging to standardize the postures taught in order to compare and use in analytical studies.7 Finally, there are few studies analyzing the impact of having a physical therapist led class versus a certified instructor lead class. One study analyzing an aquatic therapy program lead by a PT found improved adherence rates and improved outcomes compared to similar non PT lead studies.6  A similar effect could be observed in a yoga class especially one focused on individuals with diagnosed musculoskeletal conditions.

III. Unique Purpose

  Our hope is to successfully address the need for effective, efficient, affordable prevention and treatment of this debilitating condition in order to improve the lives of the individuals affected. In order to achieve this, we’ve created a 10-week therapeutic yoga program integrated with OA education in hopes to reduce limitations to successful care and improve long term adherence to health and wellness programs. Additionally, our goal is that participation in an OA personalized yoga and education program will decrease agonizing symptoms, improve understanding of the disease, and teach essential self-management skills leading to improved quality of life and well-being.

IV. Objectives

*Process Objectives*

* By 1 week prior to the start of the program, January 5, 2014, the founders of this program will successfully advertise, market and recruit 15 participants that meet
established criteria.
* The founders will recruit, select, and train 2 additional physical therapists that have accompanying yoga certifications by December 15, 2013.
* The founders will select one acceptable yoga instruction site in Chapel Hill- Carrboro, NC area by November 20, 2013.

*Outcome Objectives*

There are five objectives regarding participant outcomes that will be assessed at week 1 and at the end of week 10 of the EME-Yogaprogram.

* Participants will demonstrate decreased pain and improved functional performance on the WOMAC at the end of 10 weeks by a decrease of 22.39pts. on the pain scale, 29.12pts. on the stiffness scale and 14pts, on the physical functional scale.10,12
* Participants will demonstrate improved self-efficacy and quality of life on the SF-36 at the end of 10 weeks by a change of 30% on the SF-36.12-14
* Participants will demonstrate an adequate understanding of OA and its management by obtaining a score of 80% or greater on each of the four components that make up the Patient Knowledge Questionnaire-OA (PKQ-OA) at the end of the program.15
* Participants will demonstrate a 20% improvement in physical activity level on a seven day physical activity log from week 1 to week 10.
* Participants will demonstrate an average of 85% or greater attendance rate throughout the 10 week program.

V. Methods

*Design*

        EME-Yoga is a therapeutic yoga and OA education program geared towards improving the lives of older adults living with OA. The program is community-based, encouraging interaction of the residents in Orange County, NC in a safe setting in order to foster support systems, build community bonds and enable residents to connect with others living with similar circumstances. EME-Yoga takes place over the course of 10 weeks and requires participation in weekly yoga classes and completion of required outcome assessments throughout. Additionally, upon graduation and successful completion of the program, each individual will receive an individualized HEP and goals for continued participation.

*Setting*

        It is the goal of the founders to host this intervention program in a location that is easily accessible to all participants and provides a space that is private, comfortable and free of distractions to enable participants to focus, relax and make the most of their participation. Thus, the intervention will take place in a conveniently located, open, bright studio in Chapel Hill, NC. The yoga room is equipped with all necessary props for instruction, has adequate temperature control, hardwood floors, and a music system. The room comfortably accommodates 10-15 students, plus two instructors.

*Intervention*

Component One: Participants & Selection

        Participants of EME-Yoga are ages 50+ who have mild-moderate OA. For individual participation it does not matter the location of the arthritis; those with knee or hip OA or other areas are welcomed to participate. Exclusion criteria include comorbidities, severe arthritis and/or surgery within the past year. Selection of the 15 participants is based on the first individuals to respond to the advertisements that fit the criteria. After the program begins, no new participants are able to join the program.

Component Two: Weekly Classes & Mid-Point Check-in

        EME-Yoga intervention encourages each participant to attend a minimum of two yoga classes per week over the course of ten weeks. In order to accommodate multiple schedules, provide flexibility and improve participant adherence, four therapeutic yoga classes will be offered at varying times: 2 morning (7-8, 9-10 am) and 2 evening classes (4 – 5, 6-7 pm). At the beginning, of each week participants will pre-select their classes to increase commitment versus deciding on a day-by-day basis.

        Classes are taught by 2 licensed physical therapists with additional yoga certifications to ensure optimal teaching and skill level. Additionally, prior to commencement of the program each instructor will have completed a training module outlining each week of the 10 week yoga course to ensure standardization across classes.  All four classes taught each week will be 60 minutes in length. Weekly content (4 weekly classes) will be identical; however, content then change each week (refer to schedule below). This design ensures consistency and decreased variability of program and teachings received regardless of attended class. Additionally, participants will gain familiarity with repeated yoga sequences since they are performing them minimum two times per week and be able to review the OA information provided.

*Classes by Week:*

*Week 1: Welcome, Introductions, Intentions, Basic Yoga Postures, OA Overview and Facts*

*Week 2: Gentle Postures Continued, History of Yoga, OA Types, Diagnosis and Symptoms*

*Week 3: Yogic Breathing, More Gentle postures, OA Causes*

*Week 4: Postures for the Neck and Upper Back, How OA Affects My Body*

*Week 5: Postures for the Shoulders and Upper Extremities, OA Common Treatments\**

*Week 6: Postures for the Mid- Low Back, OA Prevention, Living with and Managing OA*

*Week 7: Postures for the Hips, OA and Psychosocial Concerns*

*Week 8: Postures for the Knees, OA and Role of Caregivers*

*Week 9: Yoga for the Whole Body, What Works for you, HEP’s, OA Support and Resources*

*Week 10: Restorative Poses for Relaxation, Importance of Decreasing Stress, Questions*

\*At week five, instructors will meet with each participant individually to assess how they are doing in the program, how easy/difficult it has been to participate in the program, setbacks, how their body has been feeling, how home and work have affected their participation, etc.

Component Three: Outcomes, Assessment and Future Practice

        The EME-Yoga program will use standardized outcome measures at the beginning and the end of the program to evaluate the program’s effectiveness. Over the course of the program, the founders and instructors will meet weekly (Sundays) to discuss areas of improvement and success from the previous week and solidify plans for the upcoming week to ensure optimal teaching practices and standardization. Additionally, discussion will include participant progress and work towards creating a HEP for each participant; information from the 5-week checkup and observation of each participant will be used in designing each participant’s HEP. Review of the HEP as well as establishing short and long term goals will take place during the last week of the program. Having a HEP and individualized goals will support continued physical activity for each individual.

VI. Evaluation

*Assessment*

EME-Yoga hopes to impact and improve various domains of health and wellness in individuals affected by OA.  These domains include: pain and function, quality of life and self-efficacy, OA comprehension and self-management skills and physical activity levels. To evaluate EME-Yoga’s effect on these domains the program will utilize the following standardized outcome measures at the beginning and end of the program:

1) The Western Ontario MacMaster Arthritis Index (WOMAC) is a 24 question assessment commonly used for individuals with arthritis to assess pain and physical function.13 Lower scores on the WOMAC indicate improvements in pain, stiffness and function; therefore, a decrease of 22.39pts. on the pain scale, 29.12pts. on the stiffness scale and 14pts. on the physical functional scale which are the defined minimal clinically significant differences will be used to define success of the EME-Yoga program. 11

2) The Short Form- 36 (SF-36) is a 36 question patient-reported survey established and widely used to assess many health domains including: “physical functioning, role limitations due to physical health, bodily pain, general health perceptions, vitality, social functioning, role limitations due to emotional problems, and mental health.”14 The SF-36 will be used in the EME-Yoga program to further assess quality of life and self-efficacy. A 30% increase in a patient’s SF-36 score, the clinically acceptable amount of change, will indicate a successful positive change in the participants quality of life.13

3) The PKQ-OA is a standardized patient questionnaire designed to assess patient knowledge of OA and how to manage the condition.15 A score of greater than 80% on each of the four components of the questionnaire will be considered adequate understanding of OA and indicate the effectiveness of the patient education portion of this program.15

4) A seven-day physical activity log will be used to assess total amount of time in minutes spent doing physical activity at the beginning of the program and at the end to compare changes in physical activity levels in program participants. A 20% increase in physical activity levels prior to and at the end of the program will determine the effectiveness of this program at improving participant’s physical activity levels.

*Limitations*

              There are several limitations of EME-Yoga: 1) There has been no direct assessment of the interest for a yoga program for individuals with OA in the Chapel Hill-Carrboro area, 2) EME-Yoga will only be able to accommodate 15 individuals, 3) there are no other programs that have been noted in a review of the literature that are similar to EME-Yoga and have integrated OA education and the practice of yoga for individuals with OA. Consequently, no previous protocol establishing optimal methods have been established. The effects of these limitations include: inability to meet the goal of 15 participants, limited ability to establish a definitive conclusion about the outcome of the program and to generalize the results across other populations, unexpected variables requiring need for protocol changes and exacerbation of symptoms leading to dropout and/or noncompliance. Also, refer to background section for other potential limitations.

*Relevance*

The founders hope EME-Yoga will lead to therapeutic yoga combined with patient education about OA and its management as a primary and complementary intervention for individuals with OA. Additionally, programs like EME-Yoga that promote social interaction and community by participation in group exercise and make patient education a priority can benefit individuals with other medical conditions as well. These additional medical conditions can include but are not limited to multiple sclerosis, fibromyalgia and cerebral palsy. Lastly, EME-Yoga can be transferred to a variety of settings.  Therapists treating patients in an inpatient and outpatient care setting as well as other community health programs may find this technique to be a valuable complement to their traditional care.

References

1. Center for Disease Control and Prevention. Arthritis Related Statistics. CDC Website. Available at:<http://www.cdc.gov/arthritis/data_statistics/arthritis_related_stats.htm#10>. Updated August 1, 2012. Accessed September 16, 2013.

2. Center for Disease Control and Prevention. State Statistics. CDC Website. Available at:<http://www.cdc.gov/arthritis/data_statistics/state_data_list.htm>. Updated August 1, 2012. Accessed September 16, 2013.

3. Robbins L, Kulesa MG. The state of the science in the prevention and management of osteoarthritis. *Am J Nurs*. 2012;112(3 Suppl 1):S3-S11. doi: 10.1097/01.NAJ.0000412644.95302.81; 10.1097/01.NAJ.0000412644.95302.81.

4. Karolla K. Biggest Arthritis Myths Busted. ABC News. Available at:<http://abcnews.go.com/Health/top-arthritis-myths/story?id=15510663#1>. Published 2/15/12. Accessed 11/18/13.

5. Bryan S, Pinto Zipp G, Parasher R. The effects of yoga on psychosocial variables and exercise adherence: A randomized, controlled pilot study. *Altern Ther Health Med*. 2012;18(5):50-59.

6. Belza B, Topolski T, Kinne S, Patrick DL, Ramsey SD. Does adherence make a difference?: Results from a community-based aquatic exercise program. *Nurs Res*. 2002;51(5):285-291.

7. Fouladbakhsh J. Complementary and alternative modalities to relieve osteoarthritis symptoms: A review of the evidence on several therapies often used for osteoarthritis management. *Orthopaedic Nursing*. 2012;31(2):115-121.

8. Zhang W, Nuki G, Moskowitz RW, et al. OARSI recommendations for the management of hip and knee osteoarthritis: Part III: Changes in evidence following systematic cumulative update of research published through January 2009. *Osteoarthritis and Cartilage*. 2010;18(4):476-499.

9. Fernandes L, Hagen KB, Bijlsma JW, et al. EULAR recommendations for the non-pharmacological core management of hip and knee osteoarthritis. *Ann Rheum Dis*. 2013;72(7):1125-1135.

10. American College of Rheumatology. Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). Available at: <http://www.rheumatology.org/practice/clinical/clinicianresearchers/outcomes-instrumentation/WOMAC.asp>. Accessed December 1, 2013.

11. Bandura, A. Self-efficacy [PDF] Happy Heart Families Website. Available at:<http://www.happyheartfamilies.citymax.com/f/Self_Efficacy.pdf>. Published 1994. Accessed November 16, 2013.

12. Escobar A., Quintana JM., Bilbao A., Arostequi I., Lafuente I, Vidaurrreta I. Responsiveness and clinically important differences for the WOMAC and SF-36 after total knee replacement. *Osteoarthritis Cartilage*. March 2007;15(3): 273-80

13. Steffen T and Seney M. Test-retest reliability and minimal detectable change on balance and ambulation tests, the 36-Item short-form health survey, and the unified Parkinson disease rating scale in people with parkinsonism. *J Phys Ther.* 2008; 88(6): 733-746. DOI 10.2522/​ptj.20070214

14.  International Quality of Life Assessment.  SF-36 Questionnaires. IQOLA. Available at:[http://www.iqola.org/instruments.aspx#sf36](http://www.iqola.org/instruments.aspx%22%20%5Cl%20%22sf36).  Accessed December 1, 2013.

15. Hill J, Bird H. Patient knowledge and misconceptions of osteoarthritis assessed by a validated self-completed knowledge questionnaire (PKQ-OA). *Rheumatology (Oxford)*. 2007;46(5):796-800. doi: 10.1093/rheumatology/kel407.