

**Recreational Therapy Evidence Based Practice Day Conference**  
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**Aquatic Exercise for Pain Management in Older Adults with Osteoarthritis**

**Search Terms:** Aquatic exercise AND arthritis AND pain management AND older adults; water aerobics AND pain AND osteoarthritis AND seniors; hydrotherapy AND arthritis AND pain reduction AND geriatrics OR elderly

**Years:** 2010 - 2015

**Databases:** EBSCO, Google Scholar, and PubMed

**Number of Articles:** 6

**Summary of Research Findings**

It is estimated that 70-80% of adults 55 years and older experience degenerative joint changes (Lim, Tchai & Jang, 2010), of which osteoarthritis (OA) has been identified as the most prevalent rheumatic disease affecting this population (Wang, Lee, Liang, Tung, Wu & Lin, 2011). Common symptoms of OA are pain and dysfunction in the affected joints (Ansari, Elmieh & Hojjati, 2014). Exercise is frequently recommended as a non-pharmacological treatment for symptoms of OA. However, many land-based exercises place strain on joints, which can exacerbate symptoms (Kim, Chung, Park & Kang, 2012). Aquatic exercise has been identified as one treatment modality that may be well suited for older adults with OA since weight loading is minimized by the water's buoyancy, which simultaneously reduces stress on joints and relieves pain (Kim et al., 2012). Aquatic exercises are generally easy to learn (Lim et al., 2010), and do not typically require expensive resources. This makes them clinically suitable for many individuals (Wang et al., 2011).

This six-article literature review examined the effects of aquatic exercise programming in reducing pain in older adults with OA. Five intervention studies (Ansari et al., 2014; Fiskens, Waters, Hing, Steele & Keogh, 2014; Kim et al., 2012; Lim et al., 2010; Wang et al., 2011) and one literature review focused on providing evidence-based application guidelines (Tilden, Reicherter & Reicherter, 2010) were included. The five intervention studies all focused on individuals with OA who were over the age of 50, with some researchers setting the minimum age for inclusion at 55 (Wang et al., 2011) or 60 years of age (Fiskens et al., 2014; Kim et al., 2012). Two studies included participants with OA regardless of the primary joint impacted (Fiskens et al., 2014; Kim et al., 2012), while three studies focused exclusively on individuals with OA of the knee (Ansari et al., 2014; Lim et al., 2010; Wang et al., 2011). Individuals in one of these studies also had co-occurring obesity (Lim et al., 2010).

Participants in all studies were community dwelling older adults. Mixed gender groups were generally used (Fiskens et al., 2014; Lim et al., 2010; Wang et al., 2011), however one study focused exclusively on male participants (Ansari et al., 2014), and another only included females (Kim et al., 2012). Sample sizes ranged from 13 (Fiskens et al., 2014) to 84 participants (Wang et al., 2011).

The aquatic exercise interventions were all structured differently, and were described as: exercises focused on strength, endurance, balance and stretching (Ansari et al., 2012); aqua aerobic exercises including bounces, jogging, kicks, twists, jumping jacks and side steps (Kim et al., 2012); walking and aqua jogging with weights (Lim et al., 2010); exercises focused on flexibility, balance, coordination, aerobics and resistance (Wang et al., 2010); and a combination of body-weight aqua fitness, body-weight aqua jogging, hydrotherapy, resisted aqua-fitness and resisted aqua-jogging (Fiskens et al., 2014).

Pain was measured using the Brief Pain Inventory (BPI) (Lim et al., 2010); the Knee and Osteoarthritis Outcome Scores (KOOS) (Ansari et al., 2014; Wang et al., 2011), the Numerical Rating of Pain Scale (NRS) (Fiskens et al., 2014); and the Visual Analog Scale (VAS) for Pain (Kim et al., 2012).

Participants experienced a significant decrease in pain (Ansari et al., 2014; Fiskens et al., 2014; Kim et al., 2012; Lim et al., 2010; Wang et al., 2011), as well as several other significant outcomes including improved motor functioning (Ansari et al., 2014); enhanced self-efficacy and reduced depression (Kim et al., 2012); decreased body fat (Lim et al., 2010); improved range of motion (Wang et al., 2011) and improved quality of life (Ansari et al., 2014; Lim et al., 2010; Wang et al., 2011). Despite these promising results, Tilden et al. (2010) emphasized that while aquatic exercises often provide short-term relief, they do not always result in long-term pain reduction. Therefore, while aquatic exercise can serve as a valuable component of an overall pain management program for older adults with OA, continuous engagement may be necessary for ongoing benefits.

**Knowledge Translation Plan**

Based on the above findings, it is recommended that recreational therapists consider using aquatic exercise to address pain management in older adults with OA through the utilization of a variety of water-based exercises focusing on strength, balance, endurance, stretching and/or aqua jogging. The Arthritis Foundation Aquatics Program (AFAP) is one resource that can provide guidance when designing interventions and selecting specific exercises (Wang et al., 2011). As depicted in Figure 1, the current literature suggests that interventions should be scheduled three times per week (Ansari et al., 2014; Kim et al., 2012; Lim et al., 2010; Wang et al., 2011) for 40-60 minutes and should be part of an extended program that is offered over six (Ansari et al., 2014), eight (Lim et al., 2010) or twelve consecutive weeks (Kim et al., 2012; Wang et al., 2011). Sessions are typically structured so they include a 5-10 minute warm-up period followed by 30-40 minutes of the designated exercises and then a 5-10 minute cool-down period (Ansari et al., 2014; Kim et al., 2012; Lim et al., 2010; Wang et al., 2011).

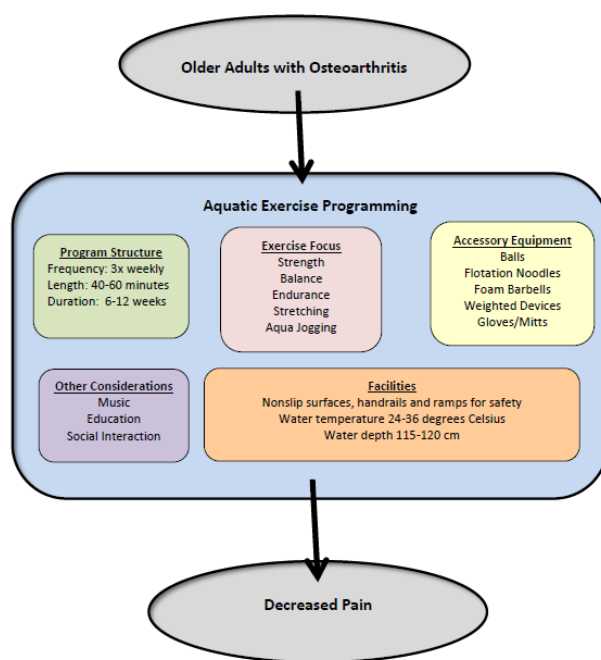
As part of overall program planning, therapists should also consider the following: facilities, water temperature and depth, accessory equipment, education and social support. For safety, it is recommended that facilities are equipped with nonslip surfaces (Tilden et al., 2010), and

that participants have access to handrails and/or ramps when accessing the pool (Fisken et al., 2014). Water temperature should be between 24 degrees Celsius (Kim et al., 2012) and 36 degrees Celsius (Lim et al., 2010; Tilden et al., 2010). This is the recommended water temperature range for persons with OA and colder water may be viewed as unpleasant by some participants (Fisken et al., 2014). However, therapists should exercise caution when working with individuals who have co-occurring cardiopulmonary disorders since performing high intensity aerobic exercise in warm pools can be contraindicated for that population (Tilden, et al., 2010). Water depth of 115 cm (Lim et al., 2010) to 120 cm (Kim et al., 2012) is also recommended to facilitate movements and maximize effects.

Accessory equipment will provide variety to exercises, reduce monotony, and minimize boredom (Kim et al., 2012). Therapists can consider balls (Kim et al., 2012), flotation noodles (Fisken et al., 2014; Kim et al., 2012), foam barbells (Fisken et al., 2014; Tilden et al., 2010), weighted devices (Tilden et al., 2010), or gloves/mitts (Tilden et al., 2010). Music can also be used to supplement the exercise (Kim et al., 2012), but should not be so loud that it is distracting or disruptive to participants (Fisken et al., 2014).

Education can be a critical component of any aquatic based exercise program, especially at the program's onset. This will assist participants in understanding the value of exercise, the purpose of the program, and the program's intended effects (Kim et al., 2012). Also, since the social aspect of aquatic exercise programs has been identified by participants as an enjoyable feature (Fisken et al., 2014), therapists should encourage peer interactions during programming and incorporate informal opportunities for social interactions before and after sessions so participants can become better acquainted (Kim et al., 2012).

**Figure 1: Recommendations for Developing Evidence-Based Aquatic Exercise Programs to Decrease Pain in Older Adults with Osteoarthritis**



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