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Perceived barriers and benefits of aqua-based exercise among older adults with osteoarthritis

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Key Words: Osteoarthritis, aqua-based exercise, barriers

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Abstract

This study aimed to (a) identify factors that motivate older adults to participate in aqua-based exercise; (b) identify potential barriers and (c) compare perceptions between older adults with and without osteoarthritis (OA). Fifteen adults over 60 years of age participated in one of three focus groups during which they discussed perceived benefits, motives and barriers to aqua exercise. Pain reduction was considered a major benefit amongst those with OA, improved health and fitness was a principal benefit for those without OA. All participants felt that the instructor could act as both a motivator and barrier, the most significant barrier was cold changing facilities in winter. With the exception of pain reduction, perceived benefits, motivators and barriers to aqua-based exercise are similar among older adults with and without OA. A greater understanding of these factors may help us to facilitate older adults with OA to initiate and adhere to aqua-based exercise.

Keywords: osteoarthritis, aqua-based exercise, benefits and barriers
Aging is associated with an increased risk of chronic diseases, one of the most common being osteoarthritis (OA). OA is considered a degenerative joint disease, characterised by deterioration of cartilage and the underlying bone (Flores and Hochberg, 2003) that leads to joint pain and stiffness. OA is the most common form of arthritis among older adults, affecting 31% of females and 20% of males aged 65-74 years and 40% of females and 22% of males over 75 years of age (Borman, Harrison et al. 2010). The large weight-bearing joints of the hips, knees and spine are most commonly affected.

Older adults tend to be less physically active than younger adults, which exacerbates the age-related losses in muscular mass and strength (sarcopenia), negatively impacting on functional ability, balance and quality of life (Henwood and Bartlett 2008). Arthritis is cited as one of the primary causes for this age-related reduction in physical activity (Minor 1996). Dunlop, Song et al. (2011) reported fewer than 1 in 7 men and 1 in 12 women with knee OA accumulated sufficient physical activity for health benefits. This suggests that older adults with OA are at even higher risk of deconditioning and consequent reduced functional ability, balance and quality of life.

Regular physical activity can help reduce the impact of sarcopenia and diminished balance in older adults and may help reduce the symptoms of OA (Ettinger, Burns et al. 1997). Performing exercise in water (aqua-based exercise) offers an environment where the joints are supported and may allow individuals to perform exercises that they would not be able to perform on land, making this form of exercise ideal for many older adults, especially those with OA. Types of aqua-based exercise include: hydrotherapy, defined as "supervised
exercise in warm water” (Eversden, Maggs et al. 2007); deep water running, consisting of simulated deep water running and a flotation device to keep the head above water (Reilly, Dowzer et al. 2003); and aqua-based fitness, consisting of partial weight-bearing aerobic and strengthening exercises performed in the shallow end of a swimming pool.

A number of studies have demonstrated positive physiological adaptations to various forms of aqua-based exercise in older adults including improved dynamic gait and balance (Waters and Hale 2007; Arnold and Faulkner 2010; Katsura, Yoshikawa et al. 2010) and increased muscle strength (Takeshima, Rogers et al. 2002; Tsourlou, Benik et al. 2006; Katsura, Yoshikawa et al. 2010). Furthermore, a recent review of the literature concluded that aqua and land-based exercise are comparable in terms of improving physical function and mobility in adults with OA and rheumatoid arthritis (RA), despite considerable variability between aqua-based exercise interventions (Batterham, Heywood et al. 2011). In addition, there is some evidence that aqua-based exercise may result in greater adherence among older adults than land-based exercise (Tsourlou, Benik et al. 2006; Fransen, Nairn et al. 2007).

While multiple factors affect physical activity levels in older adults, some of the most frequently cited barriers to exercise amongst this group are poor health (Schutzer and Graves 2004) and the physical environment (Lees, Clark et al. 2005). Motivators to exercise, although varied, are commonly linked to improving or maintaining health and fitness (Newson and Kemps 2007). However, relatively few studies have examined perceived benefits, motivators and barriers to exercise among OA patients, with even less focus specifically on older adults’ perceptions of aqua-based exercise.

A study by Der Ananian, Wilcox, Saunders, Watkins & Evans (2008) found that pain relief and improved mobility were perceived as benefits of exercise amongst mixed-aged adults with different forms of arthritis who were currently physically active. Conversely
Thorstensson, Roos, Petersson & Arvidsson (2006) found that many middle aged patients with OA had doubts about the benefits and effectiveness of exercise for reducing OA symptoms.

While relevant, the findings of these two studies, which focused primarily on middle-aged adults with different forms of arthritis, may not be directly transferable to older adults with OA. As progression of OA is associated with age, it is likely that older adults will have been living with OA for more years and their symptoms may be worse than those who are middle-aged (Dougados, Gueguen et al. 1996). Combined with the potential differences in lifestyle and social priorities between middle-aged and older adults with OA, these factors may result in a difference of perceived benefits, motives and barriers to aqua-based exercise. One study which focused on older adults with OA or RA found that long term adherence to aqua-based exercise in Korean women was affected more by the social aspect of the program than the exercise itself (Kang, Ferrans et al. 2007). Although pain relief is most often cited as the key motivation to exercise by mixed-aged adults with different forms of arthritis, the emphasis on social interaction (Kang, et al., 2007) may be due to the older age of the participants and their reduced circle of friends and acquaintances. The perceived benefits, motives and barriers specifically for aqua-based exercise amongst older adults with OA have largely gone unexplored. This lack of research is surprising as aqua-based exercise may be a safe and cost-effective therapy for older adults with OA (Cochrane, Davey et al. 2005). Although aqua-based exercise is recommended by associations such as Arthritis New Zealand and the American College of Rheumatology, the number of regularly active older adults with OA is low suggesting that a greater understanding of the barriers and motivators to participate in aqua-based exercise is needed to develop strategies encouraging more physical activity. Long-term exercise adherence is important in order to help reduce the likelihood of OA-related disability (Marks and Allegrante 2005). A study among adults with
OA, RA and other types of arthritis found participants wanted arthritis-specific programs and many felt there was a lack of available aqua-based exercise programs (Wilcox, Der Ananian et al. 2006). Whilst arthritis-specific aqua-based exercise programs may not be widely available (Cochrane, Davey et al. 2005), aqua-based fitness classes are available at many aqua facilities. Consequently it would be helpful to better understand what motivates older adults with OA to participate in this form of exercise, particularly in the long-term, and the potential barriers and whether or not these differ greatly from older adults who do not have OA.

**Method**

**Research Design**

Information related to the perceived benefits, motives and potential barriers of aqua-based exercise among older adults with and without OA was obtained through a series of focus group sessions. A focus group design was used as it offered the possibility of analyzing how people make collective sense of their individual experiences and beliefs (Marks and Yardley 2004).

**Participants**

Adults aged 60 years and older (mean age, 72.4, SD 5.5 years) who currently participate in aqua-based exercise and have regularly attended classes for at least the past 6 months, were invited to participate in a focus group. All participants attended aqua-based fitness classes two or three times per week. Classes were similarly structured, but conducted at different facilities with different instructors. Focus groups were conducted at or near the facility where participants normally exercise and consisted of participants who exercised together and who had the same experience with regard to the facility and instructor (Kitzinger 2005). Three focus groups, were held with a total of 15 participants (group 1 n=5, group 2 n=7, group 3 n=3), consisting of 1 male and 14 females. Sample size was determined by
theoretical saturation (Curry, Nembhard et al. 2009). Nine of the fifteen participants who attended the focus groups self-reported a diagnosis of OA as determined by their general practitioner. The average length of symptoms was 11.6 years, sites affected were the hips, knees, ankles, spine and fingers. Other medical conditions were not recorded.

Potential participants were invited as a whole class to attend a focus group to discuss their views on aqua-based exercise. Classes had 20-30 participants, which were primarily female, of New Zealand European descent, with 70% of attendees over 60 years of age. Once eligibility of the interested individuals was determined, an information sheet was provided. Of those who were eligible to participate, 39% agreed and subsequently attended a focus group.

Focus group participants had been attending aqua-based fitness classes for an average of 6.7 years, ranging from 3 years to 17 years. Those who had OA were not identified before or during the focus group sessions in order to ensure that the researcher guiding the sessions had no bias towards any participants or their comments. The research was conducted with the approval of the institutional research board and all participants gave informed, written consent.

**Procedures**

Focus group sessions were convened by two researchers, one who primarily guided the session and another took notes (Beyea and Nicoll 2000; Henwood, Tuckett et al. 2011). Neither of the researchers were involved in the planning, management or delivery of the exercise programmes. None of the participants were previously known by the researchers, thereby minimizing the potential for social desirability bias. Each focus group session lasted approximately 60 minutes and was recorded using a digital voice recorder and later transcribed verbatim. Notes were made of any silent agreement, obvious body language or other factor(s) not captured on the audiotape recording. The note-taking researcher was
experienced and highlighted any particularly emphatic agreement or disagreement of statements, which were utilized alongside the transcript to identify the most important themes (Loeb, Penrod et al. 2006; Henwood, Tuckett et al. 2011). Name badges were provided and used to encourage participation of quieter group members.

All focus groups were asked the same questions, focused on the benefits of exercise on land and in water and potential motives and barriers to aqua-based exercise. Questions were formulated using published guidelines (Krueger and Casey 2000) and based around questions in a similar study investigating older adults’ perceptions of resistance training (Henwood, Tuckett et al. 2011). Participants were encouraged to openly discuss their beliefs relative to the topic. The nature of the conversation was facilitated by the researchers relying on the following questions as a guide:

- What attracted you to taking part in an aqua-based exercise program?
- Do you think the benefits of regular exercise in an aqua environment are better / different from land based exercise? If so, how?
- What specific benefits do you feel you have gained as a result of taking part in an aqua-based exercise program?
- Which aspects of the program do you enjoy most?
- Which aspects do you least enjoy?

Data Analysis

Data from all participants was analyzed using the general inductive approach, which encompasses meticulous analysis of raw data in order to derive themes (Thomas 2006). This method allows identification of recurrent or significant themes without the constraint of structured methodologies such as deductive analyses and allows the investigator to describe what actually happened, rather than focus on testing a hypothesis (Scriven 1991). Initially two of the research team members reviewed and coded one of the transcripts individually.
The research team then met to review and discuss their coding, data was double checked to ensure the participants’ statements logically reflected the themes identified and a consensus was reached on coding each transcript. Major themes emerged after reading and discussing the transcripts and these were checked, alongside the transcript by a third member of the research team, similar to the approach outlined by Thomas (2006). Analysis of simple frequency counts was not considered a good indicator of the importance of a theme (Wilcox, Der Ananian et al. 2006), however statements had to be mentioned at least twice and by 2 or more participants, in order to be considered a theme (Lees, Clark et al. 2005; Galea, Bray et al. 2008). This process generated seven core domains relating to the benefits, motivators and barriers to aqua-based exercise, Table 1 provides a summary of the results and an illustration of the hierarchy of the themes and sub-themes. At this point, the participants with OA were identified and comparison was made between their comments and themes and those without OA.

**Results**

Data analysis revealed that most of the benefits, motivators and barriers relating to aqua-based exercise were similar for older adults with and without OA. Social interaction was a key theme for both groups and considered both a benefit and motivator to attend. Pain was considered a primary benefit and motivator by those with OA, whereas this theme was weaker amongst those without OA. The instructor was cited as a major theme by all participants and could be classified as a motivator or barrier; with the facility /environment also seen as both a potential motivator and barrier. General health and fitness improvements were considered a benefit and motivator to exercise amongst those with OA, although this not a key theme. Conversely, participants who did not have OA considered improved health and fitness to be key. Two other weaker themes identified by all participants were mobility and psychological benefits, which were both viewed as benefits of aqua-based exercise.
Table 1

*Primary Themes Identified from Focus Groups*

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-theme</th>
<th>Benefit/ motivator / barrier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>Pain limiting land-based activities</td>
<td>Motivator</td>
</tr>
<tr>
<td></td>
<td>Pain relief as a result of doing aqua-based exercise</td>
<td>Benefit</td>
</tr>
<tr>
<td>Social</td>
<td>Peer support and interaction during class</td>
<td>Benefit &amp; motivator</td>
</tr>
<tr>
<td></td>
<td>Social interaction following class</td>
<td>Benefit &amp; motivator</td>
</tr>
<tr>
<td>Instructor</td>
<td>Well organised instructor</td>
<td>Motivator</td>
</tr>
<tr>
<td></td>
<td>Poorly organised instructor</td>
<td>Barrier</td>
</tr>
<tr>
<td>Facility / Environment</td>
<td>Changing rooms</td>
<td>Barrier</td>
</tr>
<tr>
<td></td>
<td>Pool temperature</td>
<td>Motivator &amp; barrier</td>
</tr>
<tr>
<td></td>
<td>Others: e.g. cost/ location</td>
<td>Potential barriers</td>
</tr>
<tr>
<td>Health and Fitness</td>
<td>Feeling better / able to do more</td>
<td>Benefit &amp; motivator</td>
</tr>
<tr>
<td>Mobility</td>
<td>Improved mobility</td>
<td>Benefit</td>
</tr>
<tr>
<td>Psychological benefits</td>
<td>Improved confidence / keeping the mind active</td>
<td>Benefit</td>
</tr>
</tbody>
</table>

Pain

Pain was identified as both a motivator to participate in and a benefit of aqua-based exercise. For participants with OA, pain was a primary theme. Several of these participants
cited pain as a barrier to land based exercise, which motivated them to begin aqua-based exercise as an alternative form of exercise. One participant explained: “I have been going to walking and keep fit classes but I was having trouble with my knees at that stage and so I decided that the water would be much better so I started the aqua.” Another participant also described pain as a primary motivator to participate in aqua-based exercise: “I have arthritic ankles so it’s really the only exercise I can get. I used to go to the gym years ago and hated it, I really enjoy aqua aerobics.”

Several participants with OA also referred to aqua-based exercise as a means of pain relief, which they considered a benefit of this form of exercise:

What I find with my knee that still gives me a bit of trouble but I was in a [dragon boat] regatta on Saturday and we had 5 hard races and I just get a bit of swelling, particularly in the back of the knee and I was feeling really tight this morning but after doing all those side-kicks it’s gone you know, the lymphatic drainage.. kind of works. Similarly, another female participant felt that aqua-based exercise provided pain relief stating:

Well I have a lot of problems but I have a hiatus hernia and have tried all other sorts of exercise. I have tried the bike and jogging but afterwards, am always in pain. But after aqua... the water is cushioning and I don’t have pain afterwards, it’s amazing.

One participant who did not have OA agreed with this theme and stated: “you don’t feel pain afterwards”.

**Social aspect**

The social aspect was also a very dominant theme with all participants considering the social interaction as an important benefit and motivator to continue to participate in aqua-based exercise, regardless of whether or not they had OA. There were two key social elements identified; the support from peers and interaction during the class and the coffee
groups / social interaction after class. One participant reflected on the impact of the social interaction within the pool and how it had affected a person who previously participated in the aqua-based exercise class she attends:

She did say prior to her death that the last 6 weeks in the pool with us girls was the happiest she’d ever been in her life. ‘Cause we just talked to her, had a laugh with her, encouraged her.

A strong feeling of social support during the exercise class also came through: “I find exercising in a group is good. I slipped one day going into the pool at the steps and Jean was there right away, she helped me up.”

Whilst social interaction and support during the aqua-based fitness classes was deemed important, so too was the interaction after class. A female participant explained the significance of the post-class socialization for the group:

Most of us come 3 times per week and the friendship part, we meet at the Lemontree [cafe] and have a coffee and discuss everything, solve the politics of the world over a coffee. I think the exercise and the friendship has helped a lot of us get over a lot of things in life that... and a lot of us are on our own.

Most of the participants in the focus groups did meet for coffee after some or all of the aqua-based fitness classes. For some this was a motivation to attend the exercise class, such as one who commented: “...I don’t think I want to do that [aqua] class but then I meet for coffee afterwards... so that gets me there.”

Instructor

The influence of the instructor generated a lot of discussion and revealed that the instructor had the potential to act as both a motivator and a barrier to aqua-based exercise. The only male participant referred to the instructor as an instrumental motivational factor:
Ted really does have a big influence on us all because he brings everyone in and makes fun of things... where we’ve had other instructors coming in from outside and the thing would just go dead without him. He does the proper exercises and has the right personality.

Another agreed commenting on a particular aqua exercise teacher who used to work at the facility: “What attracted me in the first place was that Tanya who used to do it very highly choreographed and I loved that because I like dance and I like the music and I like the challenge.”

The instructor was also considered a potential barrier with one participant with OA commenting: “Some instructors try to put too much in, changing exercises all the time, they need to slow it down.” Another participant who did not have OA expressed concerns regarding the knowledge level of some instructors:

Well, I like my classes to have structure and for the instructors to know about anatomy and know what they are doing... I often wonder what qualifications the instructors need and what training they have... They should know about anatomy and what exercise in the water does. Some instructors know more than others.

**Facility / Environment**

The facility/environment was seen as both a motivator and a potential barrier, encompassing a number of aspects including the changing rooms, pool temperature and location. Participants who attend classes in a relatively new facility predominantly felt that the facility was excellent, whereas participants at the older facilities were more negative about their facility and viewed it more as a potential barrier. There did not appear to be any discernible difference between participants who have OA and those who do not have OA with regard to the facility or environment.
Changing rooms. References made to the changing rooms were generally negative particularly amongst those who went to older facilities: “...Especially in winter, those changing rooms, that area has been designed as a wind tunnel inadvertently.” Another said “Oh it’s freezing cold, the showers.”

Pool temperature. There seemed to be little consensus on pool temperature, with some preferring a cooler environment: “The pool’s too hot though, I find it too hot, it was 34 degrees the other day, I checked. It’s too hot to exercise sometimes.” Whilst other preferred a hotter pool: “… But I love it, [the heat] it’s personal.” Others commented that when classes took part in the warmer, therapy pool, they found it hard to exercise with one commenting: “It’s too hot for exercise, I just want to relax, it’s too hot.”

Location. The proximity of the facility to where participants lived was an important aspect for many. One participant was attracted to the facility because she said “It’s close to where I live.” Another agreed: “Yes, it’s close for me too, I just live around the corner.”

Other. There was some discussion around the cost of the classes, with several participants feeling that aqua-based exercise is too expensive, which may act as a barrier for some: “… At [name of facility] just a single class is something like $18 if you’re not a senior... and I thought, no wonder we don’t have any young people doing those classes.” The male participant considered parking a potential barrier when asked which aspects of the aqua-based exercise class they least enjoyed: “I think the parking... it’s hard to get a park.”

General Health and Fitness

Participants with OA referred to a number of health and fitness benefits which they believed were associated with regular aqua-based exercise: “I had a big difference in my fitness, I used to only come once per week until I jarred my ankle walking downhill, so I stepped it up to 3 times per week and it’s made a huge difference.”
Other participants mentioned noticing a difference if they take time off: “... Through the holidays, when you come back you feel it.”

Participants who did not have OA described a wider variety of health-related benefits, one stated: “I think actually I can feel that I can breathe better” and another commented that aqua-based exercise: “...improves circulation”.

Whether or not aqua-based exercise had any impact on the participants’ body weight was highly contested, with some participants feeling strongly that it had helped them lose weight: “I just do it to keep fit. I’ve lost weight, a lot of weight actually, that’s been 4 years now.” Others felt that it has had no impact on their weight: “No, my weight is the same. I don’t think I have lost any weight, I’m just the same.”

**Mobility**

Other somewhat weaker themes which emerged included mobility and psychological benefits. Participants with and without OA referred to mobility as a benefit of aqua-based exercise, with one stating: “But it’s great for mobility you know, Hilary’s scoliosis, my sore knee, that kind of thing.” Another said “I know personally that with both of my knee replacements this just keeps me going you know, just keeps me mobile and I know if I didn’t do it I wouldn’t be able to do anything.” One participant who did not have OA stated: “it helps keep the arthritis at bay”.

**Psychological Benefits**

Psychological benefits included keeping the mind active and improved confidence, again there was no discernible difference between participants with and without OA: “Yes, it keeps you thinking, it’s good for Alzheimer’s”, another stated: “... keeps me mentally active”. Another participant explained how it had improved her confidence: “Well I think you get confident, it’s increased my confidence in the water, when I first started I couldn’t, well I don’t know if I could swim but it’s certainly given me a lot more confidence in the water.”
Discussion

The aim of this study was to investigate the perceived benefits, motives and barriers to aqua-based exercise amongst older adults who regularly performed aqua-based fitness classes and to compare perceptions between older adults who have OA with those who do not. Such a study would appear to have considerable merit as older adults with OA are recommended to remain physically active (Roddy, Zhang et al. 2005) but their age and arthritis-related symptoms, such as joint pain, make many forms of physical activity difficult to perform (Der Ananian, Wilcox et al. 2008). Consequently, aqua-based exercise might offer a more suitable exercise environment than land-based and a greater understanding of the perceived benefits and motivators to participate in this form of exercise, in particular amongst long-term exercisers, may assist in increasing adherence to this form of exercise for this population.

Benefits

Older adults have identified several important factors including improved health (Henwood, Tuckett et al. 2011) and social interaction (Schutzer and Graves 2004) as key to influencing exercise adherence. However, mixed-aged adults with arthritis are more likely to rate pain relief as a primary benefit / motivator to exercise, particularly amongst those currently active (Der Ananian, Wilcox et al. 2008; Petursdottir, Arnadottir et al. 2010). Consistent with those previous studies involving mixed-aged adults with OA, RA and other forms of arthritis, the current study established that pain was both a key benefit and motivator to participate in aqua-based exercise for older adults with OA. A number of participants described the pain relief effects of exercising in an aqua environment and indicated that they felt that this form of exercise helped them to manage their symptoms. This is similar to previous studies in which mixed-aged adults with OA reported less pain following hydrotherapy compared to a land-based T’ai Chi program (Fransen, Nairn et al. 2007;
Hinman, Heywood et al. 2007). Although results of the current study indicated pain was also a theme for older adults without OA, the strength of this was weaker than for participants with OA.

The current study also identified the social aspect of the aqua-based fitness classes as a primary benefit, as well as a motivator for continued participation. This theme was equally important for those with and without OA. Participants indicated that aqua-based fitness classes offered a supportive environment where they felt secure and had the opportunity to interact with their peers. In addition, many enjoyed socialising with each other after the exercise class. Several participants lived alone and therefore felt that the opportunity for social interaction both during and after the class was invaluable. A recent study (Kang, Ferrans et al. 2007) which examined long term adherence to aqua-based exercise among older women with OA and RA also highlighted the importance of social interaction, with the social aspect deemed to have a greater influence on adherence than the actual exercise performed. However, the study did not differentiate between social interaction which took place during or after the exercise class. Studies examining land-based exercise also report the social aspect as a moderate motivator to exercise for older adults although again no differentiation was made between social interaction during or after exercise classes ((Newson and Kemps 2007; Henwood, Tuckett et al. 2011).

Previous studies which have focused on older adults have identified improved health and fitness as key factors which promote exercise engagement and adherence (Kutner, Barnhart et al. 1997; Schutzer and Graves 2004; Newson and Kemps 2007) and this was true of participants in the current study who did not have OA. However, participants who did have OA placed more emphasis on pain relief as a primary benefit and motivator to perform aqua-based exercise, with improved health and fitness considered a less influential factor. Although the prominence of this theme was different for those with OA and those who did
not have OA, participants from both groups acknowledged they noticed a difference if they stopped exercising for any reason and that the exercise made them feel better as a whole.

Improved mobility was also referred to as a benefit of aqua-based exercise by some participants in the current study but it was not a primary theme regardless of whether or not they had OA. This was in contrast to previous studies in which mixed-aged adults with OA, RA and other forms of arthritis indicated that improved mobility was one of the key perceived benefits of exercise (Wilcox, Der Ananian et al. 2006; Der Ananian, Wilcox et al. 2008). It is not known whether the greater age of the participants in the current study would have resulted in reduced expectations regarding the ability of aqua-based exercise to improve their mobility.

**Motivators**

In the present study, pain was regarded as a motivator to participate in aqua-based exercise. In particular, several participants indicated that pain had become a major barrier to land-based exercise, prompting them to try exercising in the aquatic environment, where joints are subjected to less stress. Similarly, the social aspect was indicated not only as a benefit but also a major motivator to participation. As well as the social interaction during the class, the majority of participants regularly met for coffee following the class, which provided further social interaction and support amongst the group. Participants with OA, RA and other forms of arthritis have indicated that social interaction during class is important, regardless of the mode of exercise (Der Ananian, Wilcox et al. 2008). Older adults participating in a land-based exercise intervention emphasised the preference for interaction with individuals of similar age (Henwood, Tuckett et al. 2011). This suggests that social interaction during any group exercise and regardless of health status is an important factor for older adults. However little is known with regard to the level of post-exercise social interaction following exercise classes.
Previous studies, which have predominantly focused on land-based exercise for older adults or mixed-aged adults with a variety of forms of arthritis, have generally not identified the instructor as a major theme, most probably because participants were not all involved in a group exercise program. However Der Ananian, et al. (2008), who investigated factors that influence exercise participation amongst primarily middle-aged adults with OA, RA and other forms of arthritis, noted that participants had concerns regarding the lack of aqua-based exercise programs in the community and they emphasised the need for aqua instructors to have a good understanding of arthritis. In this current study, the instructor was considered a key factor in attendance and adherence to aqua-based exercise. This was true for participants whether or not they had OA. There was concern amongst some participants regarding the knowledge base of some instructors, in particular their understanding regarding the properties of the water. Other participants felt that their instructor was a key motivator to attend and their knowledge and personality vital to a supportive environment. This emphasis on support and in particular the knowledge of the instructor may be a more significant theme amongst adults who have chronic disease(s). A study by Dodd, Taylor, Denisenko & Prasad (2006) investigating perceptions of multiple sclerosis patients’ about resistance training, also found that participants focused on the importance of an exercise leader with sufficient knowledge, viewing this as an essential element underlying the success of an exercise program.

In common with previous studies investigating benefits of exercise for older adults (Newson and Kemps 2007; Henwood, Tuckett et al. 2011) improvements in health and fitness were considered motivators to participate in regular exercise in the current study. However as stated previously, while improved health and fitness was a very important theme for those older adults without OA, this was not considered to be a primary benefit or motivator amongst participants with OA.
Barriers

The participants who took part in the current study all regularly attended aqua-based exercise classes and have done so for several years. Consequently, the perceived barriers to aqua-based exercise identified among this group would be likely to have less consequence and may differ from the barriers identified by non-exercisers. Previous studies with older adults have identified poor health, physical environment and lack of knowledge (Schutzer and Graves 2004; Newson and Kemps 2007; Henwood, Tuckett et al. 2011), as well as a fear of falling (Lees, Clark et al. 2005) as key barriers to exercise. Pain, whilst often cited as a benefit of exercise amongst mixed-aged adults with different forms of arthritis, has also been identified as a barrier to exercise, most often amongst those who do not exercise (Der Ananian, Wilcox et al. 2008). Petursdottir, et al., (2010) found that the weather acted as a barrier to exercise amongst adults aged 50-years and older with OA, a result similar to the current study whereby the weather was a potential barrier to exercise, particularly the cold changing rooms in facilities during winter. The current study did not identify any detectable difference in the perceptions of those with and without OA with regard to cold changing facilities. However, the facility where participants exercised did have an effect on their attitude, with those who exercised in older facilities being more likely to feel that the cold changing facilities were potentially a barrier. Whilst some studies have found that fluctuations in barometric pressure and temperature influences pain severity of patients with OA (McAlindon, Formica et al. 2007; Brennan, Harney et al. 2012), others such as Wilder, Hall et al. (2003) found no evidence to support this, despite a large amount of anecdotal evidence to the contrary. It is unclear whether the age of the participants in the aforementioned studies examining the relationship between temperature and arthritis symptoms would have influenced the findings, or if differences in the methodology may account for some of the equivalence of results. In the current study, pool temperature was
identified as a possible barrier, with seemingly little consensus on pool temperature preference amongst participants regardless of whether or not they have OA. Furthermore, there did not appear to be any link between pool temperature preference and participant’s age, history of OA symptoms or joints affected by OA. Poorly structured classes with ill-informed instruction were also identified as potential barriers in the current study.

**Study Limitations**

This study focused on understanding the primary benefits, motives and potential barriers to aqua-based exercise in a group of older adults both with and without OA, who were regular participants in an aqua-based fitness exercise class. Having a mixture of adults who did and did not have OA in the focus groups could be considered a limitation. However, the discussion between and among those with and without OA was considered a valid perspective given that those with and without OA exercised together. The participants who had OA were not identified before or during the focus groups. Therefore discussions were not guided in relation to OA symptoms or preferences and any differences between those with and without OA was analysed following the focus group. However, OA was established through one self-report question and pain levels due to OA or any other medical condition were not established. Therefore when pain was discussed among participants, it is not known whether this was a result of OA, another form of arthritis or other condition. It was considered most appropriate to group participants together who exercised together in order to ensure that they discussed the same exercise experience. Pre-existing groups utilises the networks in which people might normally discuss issues likely to be raised, and this is an important factor when deciding on the members of a focus group (Loeb, Penrod et al. 2006).

One question used during the focus group sessions; “Do you think the benefits of regular exercise in an aqua environment are better / different from land-based exercise?” might be considered a leading question. However, the participants had been performing
aqua-based exercise an average of 6 years and in most cases, preferred this to land-based exercise options. This suggests that these individuals believed greater benefits were gained from aqua- rather than land-based exercise. The small sample size could also be a limitation, although it is comparable to other qualitative physical activity studies of older adults (Melillo, Williamson et al. 2001; Galea, Bray et al. 2008). In addition it is believed that data-saturation was achieved, meaning little additional detail would be gained with additional participants (Guest, Bunce et al. 2006; Curry, Nembhard et al. 2009).

**Conclusion**

In this study of older adults who regularly perform aqua-based exercise, the key perceived benefits of this activity, among those with OA, were pain relief and the social contact with their peers. In contrast, for participants who did not have OA, the social aspect and improved health and fitness were key benefits. The primary motivators to exercise also included the social aspect of attending classes and for many participants, regardless of whether or not they had OA, the instructor. Potential barriers to aqua-based exercise for both groups of older adults included poor facilities, which were negatively affected by the weather and poor instruction. However these participants were long-term exercisers and potential barriers identified by them had not prevented them from attending classes. The findings of this study may help develop more suitable aqua-based exercise programs and environments to encourage long-term adherence. Future research focusing on those who have discontinued exercise programmes would be helpful in identifying further barriers to aqua-based exercise for older adults with OA.
References


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