Perceptions towards aqua-based exercise among older adults with osteoarthritis who have discontinued participation in this exercise mode

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Abstract

Purpose: This study aimed to investigate reasons for ceasing participation in aqua-based exercise among older adults with osteoarthritis (OA).

Method: Eleven adults over 60 years of age with OA participated in one of two focus groups, during which they discussed barriers to aqua-based exercise as well as potential benefits of this exercise mode. Each focus group was audiotaped, transcribed and then analysed using the general inductive thematic approach. The investigators reached a consensus on all coding categories and then identified themes.

Results: Key barriers identified were a lack of suitable classes and insufficient instructor knowledge, which often led to increased pain, and cold water/changing facilities. Key perceived benefits included increased physical ability in water and social interaction.

Conclusions: A greater understanding of reasons for ceasing participation in aqua-based exercise among older adults with OA may help facilitate development of suitable exercise programmes that minimise barriers for this group.

Keywords: Aqua-based exercise; Barriers; Benefits; Osteoarthritis

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Osteoarthritis (OA) is a common form of arthritis amongst older adults, with over 31% of females and 20% of males aged 65-74 years having OA (1). Symptoms of OA include joint pain and stiffness (2) especially in the large weight-bearing joints such as the hips and knees, although the spine and hands are also commonly affected (1).

Regular exercise is beneficial for older adults, helping to prevent disease and maintain physical function, body composition and balance. However older adults with OA have lower levels of physical activity than older adults without OA (3). Pain has been cited as a barrier to exercise for adults with OA and other forms of arthritis who do not regularly exercise (4, 5). Conversely, adults with OA and other forms of arthritis who do exercise regularly often cite pain relief as a benefit and motivator to exercise (4, 6). Despite the potential for pain relief and the role of regular exercise in reducing the likelihood of OA-related pain and disability (7), the majority of adults with arthritis are not physically active on a regular basis (8).

Aqua-based exercise may offer a safe and appropriate setting for older adults with OA. Different forms of aqua-based exercise include hydrotherapy, aqua-jogging and aqua-fitness (9). These forms of exercise all provide varying degrees of buoyancy, which reduces the stress on joints and may lessen pain for those with OA (10). Although aqua-fitness and aqua-jogging are often available at community swimming pools and attended by many older

adults, few studies have investigated perceptions of older adults with OA regarding aqua-based exercise and what the potential barriers are to ongoing adherence.

A recent study investigating perceived benefits and barriers to aqua-based exercise explored opinions among older adults with OA who currently participate in this form of exercise (9). Key perceived benefits included pain relief and social interaction. When questioned about potential barriers, participants identified cold changing facilities and poor class instruction. However, as these individuals had been performing aqua exercise for an average of 6.7 years, these barriers were not sufficient to cause participants to stop attending classes. An exploration of the reasons for older adults with OA ceasing participation in this type of exercise may contribute to the development of more sustainable aqua exercise classes for this population.

The current study aimed to provide insight into the factors contributing to older adults with OA ceasing participation in an aqua-based exercise programme. Since aqua-based exercise is recommended by a number of arthritis associations, it would be useful to have a greater understanding of perceptions (perceived barriers and benefits) towards this form of exercise among older adults with OA. Such data will hopefully allow aqua exercise providers to better cater to the unique physiological and social needs of older adults with OA, so to increase adherence and ultimately the benefits derived from this exercise.

Methods

Similar to other studies involving older adults' perceptions of exercise (9, 11), focus groups were utilised to gather qualitative information relating to the perceived barriers and benefits of aqua-based exercise among older adults with OA who have tried, but no longer participate in this form of exercise. Focus groups were chosen since they enable an exploration of peoples beliefs, opinions and experiences and allow examination of different perceptions and priorities within a group or social environment (12). Furthermore, in older adults focus groups may increase the comfort level of individuals to freely discuss their opinions (13).

Participants

Adults aged 60 years and older who had been diagnosed with OA by their General Practitioner and who had previously, but no longer participate in aqua-based exercise were invited to take part in a focus group. A total of 11 female participants volunteered and were randomly allocated to one of two focus group sessions (group 1 n = 5, group 2 n= 6). Demographic details were collected at the time of the focus group meetings (see Table 1). OA was self-reported to the researcher with other medical conditions reported included hypertension, fibromyalgia, asthma and type-II diabetes. Participants had all tried either aqua-fitness or aqua-jogging classes at different pool facilities within the same region of New Zealand.

Insert table 1 about here

Procedure

Advertisements were placed in medical centres and health clinics, as well as in a local newspaper and on the Arthritis New Zealand website and a number of short presentations were delivered at arthritis support groups and other social meetings in order to attract participants. Individuals who volunteered for the study were contacted by telephone and their eligibility determined. Participants were mailed and asked to read an information sheet before attending a focus group at a community centre where they signed a consent form before the focus group began. Although male and female participants were sought, all those who volunteered to participate in the study were female. The research was conducted with the approval of the institutional research ethics board.

The focus group sessions were overseen by two researchers, one who primarily led the conversation and one who took notes. None of the participants were previously known to the researchers and as such, the potential for social desirability bias was limited. Each focus group lasted approximately 60 minutes and was recorded using a digital voice recorder and later transcribed verbatim. Notes were made of any silent agreement or obvious body language not captured on the audiotape recording. Ardent agreement or disagreement among the group of any statements made were utilised alongside the transcript to identify the most important themes (13, 14). Both focus groups were asked the same semi-structured interview questions, which aimed to explore participant's experiences and opinions regarding aqua-based exercise. Questions were specifically chosen to gain insight into the perceived barriers and reasons for ceasing participation in aqua-based exercise. It was also considered relevant to explore perceived benefits of this form of exercise.

The questions outlined in Table 2 were used to guide the conversation, questions were formulated using guidelines for question development (15, 16). In addition, questions were similar to those used by Fisken et al., (9) who explored perceived benefits and barriers among older adults with OA who were current aqua-exercisers.

Insert table 2 about here

Data Analysis

Data from all participants was analysed using the General Inductive Thematic approach, which involves multiple readings and analysis of the raw data in order to derive themes (17). This method has been recommended for health research as it allows significant themes to be established without the restriction associated with structured methodologies such as deductive analysis. This permits the researcher to focus on what is revealed by the raw data, rather than concentrating on testing a hypothesis (17).

In the first instance, two members of the research team individually reviewed and coded one of the transcripts. The other members of the research team then reviewed each transcript and the coding was double checked to ensure that they reflected participants' views (11). Themes were developed after reading the transcripts repeatedly, until no new themes emerged, similar to the approach outlined by Thomas (17). This process created several core themes relating to the perceived barriers and benefits of aqua-based exercise.

Results

Several key themes were identified. Barriers included environmental factors such as a lack of suitable classes and knowledgeable instructors as well as cold water and / or changing facilities and cost. In addition, two participants had a skin reaction to the pool water. Key benefits included being able to do more in the water, the properties of water and social interaction. The key themes and representative quotes are included in Table 3.

Insert table 3 about here

Insert table 4 about here

Discussion

The primary objective of this study was to examine perceived barriers and benefits to aqua-based exercise amongst older adults with OA who have previously but no longer engage in this form of exercise. Key themes relating to the discontinuation of aqua-based exercise included: insufficient availability of suitable classes and trained instructors and environmental factors, such as cold water or changing facilities and cost. Despite these barriers, participants believed that aqua-based exercise offered a number of benefits including the ability to do more in the aqua environment, the properties of water and the opportunity for social interaction. General health and fitness was also identified as a slightly less significant theme.

One of the primary reasons given for discontinuing an aqua-based exercise programme was that participants felt the class they had attended was not suitable for their age or functional ability. In particular, exercising at a higher intensity than they perceived

suitable, sometimes resulted in pain the following day, which was a strong barrier to exercise adherence. Pain has been widely reported as a barrier to exercise among adults with various forms of arthritis (5, 6). Participants in the current study felt strongly that they should be attending classes suitable for their age and functional ability but that there were no such classes available. Training with others of a comparable age was also considered imported in the current study. Similarly, older adults who performed land-based resistance training identified this as an important facilitator for exercise (14). Attending age and / or ability appropriate classes may have increased adherence to aqua-based exercise among participants in the current study.

Environmental factors, including the instructor, were also considered potential barriers. Participants deemed it important for the instructor to understand their age and condition and several participants expressed concerns regarding the instructor's knowledge of ageing and OA. This theme has been identified in a study by Wilcox, Der Ananian et al. (5) who found that participants with arthritis considered the lack of qualified aqua instructors who understood their physical limitations was a major barrier. In the current study, a combination of poor instructor knowledge and a lack of suitable classes for this population created sufficient reason to cease participation for many participants.

Another environmental barrier was cold water or changing facilities, particularly during winter, at the community swimming pools attended. A number of previous studies investigating perceived barriers to exercise amongst older adults have also established that poor weather is often considered a barrier to exercise (18, 19). Fisken et al., (9) who focused

specifically on perceptions of aqua-based exercise, also noted that cold pool or changing room temperature was considered a potential barrier even in those older adults with OA who had continued aqua-based exercise for an average of around 6 years. There is considerable anecdotal evidence to suggest that pain severity of patients with OA increases in colder temperatures and a number of studies have indicated that pain due to OA is negatively influenced by rises in barometric pressure (20). This has important implications since pain itself is considered a key barrier to exercise amongst adults with arthritis (5, 6, 21). A report by Bunning and Materson (22) stated that compliance to an aqua-based exercise programme decreases amongst people with OA when the water temperature drops below 29 degrees Celsius. This was consistent with the current study in which most participants indicated a preference for pools with temperatures of 30 degrees Celsius or more and several ceased participation if temperatures were too low.

Two weaker environmental themes that emerged were cost and skin reaction to the pool water. Several participants in the current study felt that cost was a barrier to continued participation in aqua-based exercise and this applied regardless of whether they had attended a private or public facility. Not surprisingly, socioeconomic status would appear to be a major factor in whether or not cost is perceived as a barrier to activities like aqua-based exercise. Skin reaction to the pool water was described by 2 participants in the current study. Ageing skin is associated with changes in the epidermis, which becomes thinner thus reducing the effectiveness of the skin as a barrier. This may result in the skin becoming more sensitive to potential irritants (23, 24). Emollient therapy is considered useful for reducing skin sensitivity (24), however, it is not known whether this could offer a cost-effective tool to

prevent or minimise skin reactions for susceptible older adults, or may have allowed those affected to continue participating in aqua-based exercise.

Although participants in this study had not maintained regular, ongoing participation in aqua-based exercise, it was important to gain insight into why older people with OA were motivated to try this mode of exercise. One of the key benefits they identified was feeling able to do more in the water and finding it easier to exercise in the pool than on land due to the properties of water. Previous studies have identified reduced pain and stiffness as well as improved mobility and function as key benefits of exercise among current exercisers with different types of arthritis (5, 6, 21). Decreased pain symptoms have been associated with water immersion due to increased sensory input and decreased joint compression (25), which may contribute to the feeling of being able to do more in water.

A review of literature identified social support as a key predictor of exercise adherence among adults with OA (7). Similarly, social stimulation was identified as at potential benefit by all but one participant in the current study. Participants referred to aqua-based exercise classes as having provided an opportunity to get out of the house and reduce the feeling of isolation. Social isolation is believed to have a significant effect on depressive symptoms in older adults (26). Depression is considerably more prevalent amongst people with OA than those without this condition (27). However, regular participation in activities such as aqua-based exercise may help reduce feelings of isolation among older adults with OA and consequently lessen depressive symptoms. A study by Litt et al., (28) observed that older women are far more likely to adhere to an exercise programme if there is social support

for their behaviour. However less is known about the perceived importance of social interaction during exercise for older males with OA and further research is required for this population.

Older adults most often cite health and fitness as key motivators to exercise (29), however this did not emerge as a major theme in our focus groups. This coincides with previous research which has identified differences in the primary perceived benefits of exercise identified by apparently healthy older adults, who are most likely to cite health (19) and adults with OA, and other forms of arthritis who are more likely to identify pain reduction or symptom relief (5, 6).

The current study identified similar perceived barriers and benefits to aqua-based exercise among older adults with OA who no longer participate in this form of exercise, to those identified by current aqua-exercises in an earlier study (9). This raises questions as to why some participants adhere to an aqua-based exercise programme, despite these barriers, whilst others drop out. Self-efficacy has been positively linked with exercise adherence (5). It is not known whether self-efficacy levels affect perception of the barriers versus benefits among participants, or whether those with higher levels of self-efficacy are better at developing strategies in order to overcome barriers. Social support from friends, family or healthcare providers has also been linked with increased exercise adherence in adults with arthritis (5). This may be a particularly relevant factor for older adults with chronic disease, such as OA. For example, reassurance with regard to post-exercise muscle pain from a

relevant health provider could influence the likelihood of continuing with an exercise programme or ceasing participation due to concerns regarding a negative effect.

To the best of our knowledge this is the first study to investigate the perceived barriers and benefits of aqua-based exercise specifically among older adults with OA who have tried but not maintained ongoing participation in this form of exercise. Since aqua-based exercise is widely recommended for adults with OA (30), it is important to gain a greater understanding of the perceptions and potential barriers to this form of exercise. Whilst this study has provided some new insight about the perceptions of aqua-based exercise among older adults with OA, there are several study limitations. Firstly, it is important to acknowledge the potential for selection bias which is inherent when participants voluntarily take part in this type of investigation. Potential participants who declined, or did not have the opportunity to take part in the study may have held different opinions regarding the potential barriers and benefits of participating in aqua-based exercise. In addition, participants were all female, inclusion of male participants may have resulted in some different perceptions and themes. There is a possibility that focus group discussions may result in a group response, however this was not believed to be a factor in the current study as participants appeared to talk freely about their experiences and opinions. It should also be noted that due to the age of the participants, many had co-morbidities, which may have contributed to their attitudes relating to aqua-based exercise.

Conclusion

Older adults with OA are particularly susceptible to functional impairment and reduced levels of physical activity, which can have a negative effect on independence and quality of life. Aqua-based exercise is widely recommended as a suitable form of exercise for older adults with OA. This study helps supplement current knowledge with regard to perceived barriers and benefits of participation in aqua-based exercise among older adults with OA, by focusing on those who initiated but have not continued with this form of activity. The primary barrier identified in the study was the lack of suitable age or ability appropriate classes. In addition, cold water / facilities were also considered a significant barrier to long-term adherence. Despite these barriers, participants did acknowledge that aqua-based exercise provided them the opportunity to move more freely and interact socially, and all expressed a willingness to undertake this form of exercise in the future, provided the class addressed these barriers. Providers should be educated with regard to barriers among older adults with OA with a view to increasing provision of suitable classes and facilities in order to encourage long-term adherence to aqua-based exercise.

Key points

- Perceived barriers and benefits of aqua-based exercise among older adults with osteoarthritis are similar between current and ex-exercisers.
- Key barriers included lack of suitable classes / poor instructor knowledge and cold facilities.

- Despite these barriers, aqua-based exercise offers older adults with osteoarthritis the opportunity to exercise in a supportive environment which also facilitates social interaction.

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1 **Table 1.** Participant Demographics

Characteristic	Value
Age, years	69.3 ± 4.0
Duration of arthritis symptoms, years	13.1 ± 9.3
Sites affected by OA (n=11)	
Hip(s)	5
Knee(s)	5
Spine	3
Hand(s)/finger(s)	3
Ethnicity	
NZ European	6
Maori	2
Other	3

2

3

Table 2. Broad Questions used to guide focus groups

Topic	Specific questions
General attitudes towards exercise	What do you think are the benefits of regular exercise? What do you think are the key differences between aqua-based exercise and land-based exercise? Why did you decide to take up aqua-based exercise? Where did you participate in aqua-based exercise? What type of aqua class did you attend?
Benefits of aqua-based exercise	Which aspects of the aqua-based exercise programme that you attended did you most like?
Barriers to aqua-based exercise	Which aspects of the aqua-based exercise programme that you attended did you least like? What were the primary reasons for stopping aqua-based exercise?
Current status	Do you currently participate in any other form of regular exercise? Would you consider re-starting an aqua-based exercise programme?
Additional factors	We wanted you to help us to evaluate your reasons for taking part in and stopping an aqua-based exercise programme. Is there anything that you came wanting to say that you haven't had a chance to say?

1 **Table 3**. Themes relating to barriers to aqua-based exercise derived from focus group sessions

	Themes	**Illustrative quotations**
Barriers	Inappropriate Classes	"I found it was going too fast for me and I didn't like that, I couldn't keep up, couldn't hold some of the equipment.. and the day after I just couldn't cope, I was in so much pain"
		"I didn't enjoy the classes because they were too strenuous"
		"Somebody took over and I couldn't keep up with the class and I just gave it away, not able to keep up""I found it very stressful to be honest because I felt like I had to do the same as the others and keep up... they were all young, athletic ones. Too competitive, that's what I found"
	Instructor	"The instructor was not geared up for my particular disability [OA]... and I found it very stressful"
		"Perhaps it could be recommended within this study that aqua-aerobics instructors be more attuned to older people and their needs as opposed to younger people, or specific ones that will help people with arthritis"
		"I think knowing that aqua is for people possibly who have arthritis or conditions like that, that I

	think they ought to have, perhaps do an extra training course or something to fit, to accommodate that. It's not the same as going to a gym, if you've got arthritis you're not necessarily going to work out at the gym are you but if you're going to aqua aerobics you're going possibly because you've got arthritis.. the water's beneficial so"
Age-specific	"I would love to see something for the elderly people, to be active and keep reasonably fit. There's very little around for the older people. They don't want to know the older people"
	"It's got to be paced at our age range"
	"They need to have something for the older people, keep the younger ones different"
	"Well I think it's important that you go, even if it's on land, that you go with people relative to your own age and that you're all at the same level 'cause I mean if you go with a 30-year old... we can't keep up with that, as much as we'd like to. Whereas if you go and you're all this age, you encourage each other"

Facilities	"I suppose one of the reasons why I did stop is because it's coming up to winter and it's outside... and it's cold.. I would like to go to a class in a hotter pool" "Very cold, I found that a real downside" "At [the pool I attended] that was the worst... coming out you were freezing cold and you have to get changed back again" "The water wasn't warm enough for me, this was a class at about 5 o'clock, the other thing was where I went you parked your car and you had to take quite a big walk to the actual pool and then after a few weeks when it was getting towards winter it would be dark when you came out and I didn't feel it was very safe. I'm not sure about the security round there"
Cost	"Then I ran out of money basically... it's very expensive, to belong to a gym club" "I mean some of them charge an awful lot to get in. When you go up to the pool it's $2 and then you get charged $5 to go into the aerobics, well that's really, sort of, you know, pay for the guys

		time, that person's time but when you're on a pension you haven't got that"
		"The cost, when you're on a limited budget"
	Reaction to water	"When I was in [name of pool] I stopped going because I got chlorine burns on my skin, from here (indicated chest level) right up"
		"That's right, it was like weeping eczema and the arthritis society was so worried because I was going to one of their classes at the beginning and they said that they wanted to take it further and of course I became allergic to a lot of the minerals that are added to the [name of pool]"

Table 4. Themes relating to benefits of aqua-based exercise derived from focus group sessions

Benefits	Able to do more	"My knees were getting really bad and I, so I thought, well the only thing I can do really is to do aqua, which I did and I love it"
		"I started doing it because I can't walk very far and I needed some form of exercise and that's what prompted it"
		"I could walk solidly in that pool for an hour but I'm lucky if I can walk down the end of my drive"
		"I'm able to do a lot more in the water than when I was going to the gym"
	Properties of water	"I love the water because it doesn't impact so much, it's a lot easier on your joints and the water keeps you balanced"
		"The buoyancy... I like deep water, I don't like the shallow water aerobics 'cause I feel easier in the deep water. It takes the impact off your joints... it gives you freedom... if you've been used to

	sitting down, being sedentary and not being able to move around... the water makes you feel wonderful” “Yes I can go into the water because the weight of the water takes it off the body”. “In particular you know the aqua aerobics, you don’t put your weight on your legs, that’s the main thing”
Social	“You know, you’re not stuck at home all the time, it’s a way of getting out” “It’s nice to be out in a group and not feel so isolated so it was a good, psychological it was, really good” “I think it’s important to be with other people, how other people cope and that you’re not alone and there are other people you know, in similar situations”
General health	“Strengthening your muscles... keeping your weight down... keeps you in shape”

	"Keeps the body moving, takes your mind off it, it's good to be outside. Yea, keeping active, or else if you've got osteo, it can get you right down, if you stay inside you just mope about it"