

## Patient reported benefits of hydrotherapy for arthritis

**Peter Larmer** *DHC, MPH, FNZCP*

*Head, School of Rehabilitation and Occupation Studies, AUT*

**Paula Kersten** *PhD, MSc, BSc (Physiotherapy)*

*Associate Professor, Person Centred Research Centre, School of Rehabilitation and Occupation Studies, AUT*

**Jordy Dangan** *BSc (Physiotherapy)*

*Medical student (Deakin University)*

### ABSTRACT

The evidence for the effectiveness of hydrotherapy as an intervention for arthritis sufferers is varied. It has been suggested that the outcome measures used in previous studies may not measure the outcomes that patients consider important. A qualitative study was undertaken to identify patients' perceived benefits. Fifteen people with arthritis, recruited from Auckland hydrotherapy services, participated in either a focus group or an individual interview in which they discussed their perceived benefits of hydrotherapy. Following the focus group interviews three key themes emerged: Opportunities to exercise, Physical benefits and Psychological benefits. This study identified themes that present outcome measures may not be capturing. Therefore, it is suggested that a new outcome measure be developed from the themes identified in this study.

*Larmer P, Kersten P, Dangan J (2014) Patient reported benefits of hydrotherapy for arthritis New Zealand Journal of Physiotherapy 42(2): 89-93.*

Key words: Arthritis, Hydrotherapy, Outcome measures.

### INTRODUCTION

Hydrotherapy has been used as a form of rehabilitation by the Romans, Greeks, Egyptians and Indians since around 2000BC (Campion 1996). More recently, hydrotherapy is recommended by a number of international arthritis guidelines as an appropriate intervention for the management of arthritis (Brand et al 2009, Hochberg et al 2012, National Collaborating Centre for Chronic Conditions 2008, Peter et al 2011, Zhang et al 2008). However, the levels of evidence that these guidelines are based on range from neutral to strong (Larmer et al 2014).

The importance of valuing the patient's perspective is gaining increased focus in evaluating the effectiveness of treatment in chronic conditions (Parker et al 2003). Consequently, there is a rise in the use of patient reported outcome measures (Horner and Larmer 2006, Kirwan and Tugwell 2011, Laver Fawcett 2007). Researchers face a dilemma in choosing outcome measures that provide meaningful results and frequently fail to mention if consideration has been given to the content of the outcome measure and which specific aspects are to be measured (Grotle et al 2005). Our recent systematic review investigating patient reported hydrotherapy outcome measures identified that inappropriate outcome measures may have affected the findings in many studies (Larmer et al 2014). For example, the most commonly used outcome measures include the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) (Bellamy et al 1988) and the Visual Analogue Scale (VAS) (Huskisson 1974). Whilst these measure a few OA symptoms such as pain and stiffness, they are not specific to the aims of hydrotherapy. In addition, the aforementioned outcome measures have been shown to be problematic in terms of their validity. For example, the WOMAC has been shown to lack responsiveness with effect sizes being dependent upon patients'

scores at baseline (Kersten et al 2010). The pain visual analogue scale is probably the most widely used outcome measure for pain. However, patients attending pain clinics have reported difficulties using it to judge how to rate their pain on the pain VAS line, finding it 'not very accurate', 'sort of random', 'almost guesswork' or having to 'work it into numbers first' (Jackson et al 2006). A previous review of the VAS demonstrated the VAS is an ordinal scale, rather than an interval scale as many assume (Kersten et al 2012). Ordinal scales are inherently difficult to interpret when used to measure change as a one point increase along one part of the scale may not constitute the same amount of change as a one point increase elsewhere on the scale (Kersten and Kayes 2011). Consequently, they should only be analysed using non-parametric statistics as opposed to parametric statistics used by researchers in hydrotherapy (Bartels et al 2009).

Larmer et al (2014) raised the possibility that outcome measures used in hydrotherapy research are not specific or sensitive enough to identify meaningful change in an arthritic hydrotherapy population. This is of concern given that hydrotherapy is taught in many undergraduate physiotherapy curriculums, as evidenced by the number of texts produced (Brody and Geigle 2009, Cameron 2009, Eidson 2009, Hecox 2006, Nolan and Michlovitz 2005). It would appear that consumer groups recognise the perceived benefits of hydrotherapy; Arthritis New Zealand reports that arthritic patient groups request hydrotherapy more frequently than any other form of therapy or treatment (Arthritis New Zealand 2010). However, specifically what these benefits include is unknown. Therefore, this study aimed to explore the perceived benefits of hydrotherapy from a patient's perspective.

## METHODS

Focus groups were the predominant method of data collection as they are an efficient data collection technique to identify key concerns and to enable shared experiences to prompt deeper thinking and debate on a topic (Kitzinger 1995, Krueger and Casey 2000). As some people prefer individual interviews over focus groups this was also offered as an option. Purposeful sampling (Patton 2002) was used to recruit participants with osteoarthritis (OA) from the general public. In particular, we aimed for the focus groups to contain a mix of participants suffering either hip or knee OA. Inclusion criteria were people (1) with a diagnosis of hip and/or knee OA, (2) who participated in a hydrotherapy exercise programme in Auckland, New Zealand, and (3) who were aged 50 to 85, as this is the predominant age of those affected with OA (Ministry of Health 2012). Exclusion criteria included people who could not (1) give informed consent, (2) communicate in English, (3) hear or speak in a decipherable way.

Participants were recruited via three hydrotherapy services in Auckland. Clinicians from these services handed recruitment packs to potential participants. Those interested contacted the researcher who provided further information about the study, answered questions and took informed consent if the person wished to partake.

Each focus group was led by a facilitator and supported by an observer/note taker. Refreshments were available prior to the commencement of each group, providing an opportunity for a brief period of informal social interaction between participants on arrival (Kitzinger 1995). The moderators briefly explained their roles and offered participants the opportunity to clarify any last minute points about the research purpose or group procedure. An interview guide was used flexibly, allowing participants to elaborate and facilitating flow of discussion (Appendix 1). Demographic information, including age, sex, ethnicity, affected joint, and disease duration were also collected.

Focus groups and individual interviews were audio-taped and transcribed. A subjective interpretation of the texts was undertaken with data analysed using a content analysis framework (constant comparative methods), to identify themes of importance within and across the different participant groups (Hsieh and Shannon 2005). Data analysis was led by one of the authors (JD) with support from the two co-authors. Rigour checks (team meetings and peer feedback) occurred to discuss interpretation of data (Barbour 2001).

## RESULTS

Fifteen participants were recruited and took part in three focus groups and one interview. Their characteristics are displayed in table 1.

During the focus groups and interview participants spoke of the benefits of hydrotherapy. They did not raise any barriers to hydrotherapy. Three key themes were identified in relation to the perceived benefits: opportunity to exercise, physical benefits, and psychological benefits.

**Table 1 Participant characteristics**

Sex	
Female	12 (80%)
Male	3 (20%)
Age	
56-60	2 (13%)
66-70	3 (20%)
71-80	9 (60%)
>80	1 (7%)
Ethnicity	
New Zealand European	14 (93%)
Samoan	1 (7%)
Location OA	
Hip	4 (27%)
Knee	5 (33%)
Both hip and knee	6 (40%)
Time since diagnosis	
≤ 1 year ago	1 (7%)
1-3 years ago	2 (13%)
≥3 – 5 years ago	3 (20%)
≥6 years ago	9 (60%)

### Theme 1: Opportunity to exercise

Having the opportunity to exercise, in the form of hydrotherapy, was a strong theme evident across all participants. Due to the participants' arthritis, land-based exercise was often considered too difficult or painful.

*Since I've been coming to the pool it just makes such a huge difference. Coz like everyone else I'm able to do an awful lot more in the pool than I can on the outside. I have an exercise cycle at home, but it's not as good for me as being in the pool. (Participant 9)*

In addition the buoyancy effect of the water was described as a strong benefit of hydrotherapy, helping participants to keep their balance and to do certain exercises that were too difficult on land.

*I'm prone to falls, when I fall I just crash and I find I feel safe in the water. I can't fall...the waters sort of there, buoyant, holding you there, you can do an awesome range of exercises that you can't and certainly wouldn't be safe doing out of water. I wouldn't even try it. (Participant 5)*

Similarly, the buoyancy enabled them to work harder.

*I find the buoyancy really helpful...it gives you a range of different types of movement and different types of exercise so you feel as though you're getting a more thorough workout. (Participant 2)*

Participants also discussed the importance of the warm water to exercise in, helping to relax muscles and easing pain, a benefit they didn't gain from public pools.

*In the break in the summer time, I've gone to the normal pool, ah the normal public pool and tried to do my exercises there. And you try to do them... your less stiff after you come out, shall we say, than before you went in but you don't get the same kind of pain relief as from the heated water. (Participant 13)*

And importantly for some, being in a normal pool gave them extra symptoms.

*After about 20 minutes in that temperature of the normal public pools you tend to get cramp, I do anyway. You tend to start cramping up because you actually get cold. So the water there, isn't warm enough really for arthritic people. Definitely not. (Participant 14)*

Thus, the findings showed that the buoyance of the water helped people feel safe and better balanced, and the water temperature eased pain and stiffness. These factors helped them to work harder and do a different range of exercises than they would be able to do on land or in a normal pool.

### **Theme 2: Physical benefits**

People discussed a range of physical benefits from hydrotherapy. Pain relief was described as a benefit from hydrotherapy and was ascribed to warmth and buoyancy.

*It's just a relief to get into the water to get out of pain, coz as you get into the water you actually can feel such a feeling that a lot of the pain of the arthritis, I put it like, melts away. (Participant 13)*

Not only did the pain itself ease, but hydrotherapy helped participants shift the focus from the constant pain that were experiencing.

*It takes your mind off it. It takes your mind off, my pain. It's there all the time, but when I get in the water, it lifts away from me. (Participant 4)*

Along with the pain reduction the added benefits of being able to exercise was noted. Gaining strength through hydrotherapy was described by participants.

*I had a problem with no strength. I could lie on my side with my knees and my ankles together and I could not lift my leg, my right leg up. And no problem now, and all other parts of my body too are so much stronger. (Participant 9)*

Similarly, participants described feeling less stiff after hydrotherapy and feeling more mobile and flexible.

*At least 50% difference in the stiffness when I get out of the pool. (Participant 13)*

The importance of regular exercise was also identified. Participants reported that they had noticed deterioration in their physical functioning when they were unable to attend.

*It's helped my joint flexibility, very definitely, I feel more flexible and when I haven't been to the pool for some weeks I notice it. I seize up a little bit more and then after a session, even one session, you can feel more mobile. (Participant 2)*

The physical benefits were enhanced through working with an experienced instructor.

[participant commenting on the exercises the instructor had developed for her]: *Looking around, people have got different disabilities so it's good to know that you're not wasting your time on doing something that's really not for you. It's absolutely on the button, every single one of those exercises. (Participant 1)*

Thus, participants perceived that taking part in hydrotherapy resulted in physical benefits, including pain relief and improvements in strength, flexibility and mobility.

### **Theme 3: Psychological benefits**

Participants described psychological benefits from going to hydrotherapy. For example, while participants understood arthritis was a long term condition the sessions helped to gain a sense of control over their condition.

*You feel proactive. You feel, I'm doing something about what's happening so you're not the victim, your proactive. (Participant 2)*

In addition, engaging in hydrotherapy gave them a sense of achievement.

*It's not just the swimming, it's getting up in the morning, knowing that I'm going somewhere today that's going to help...and when I get home I make a cup of tea and reward myself. I feel like I've achieved something. (Participant 3)*

And others recognised the severity of their condition but reported hydrotherapy helped lift their mood.

*A general sense of well being afterwards to, coz arthritis can be a very depressing illness. (Participant 13)*

Sharing and comparing their health condition with like sufferers was also identified as beneficial. The sessions helped participants gain a better perspective on their condition, through comparing to others and talking with others in similar situations.

*When I saw what some people are having to deal with on a regular basis and still so cheerful...it takes your mind off your own business and you just get in, and work it, and it feels good. (Participant 2)*

In addition, talking with others in similar situations were provided as part of the group based hydrotherapy.

*It's been an awful shock to get sick. I've hated it. Hated finding out that I haven't been well. It's been really really difficult, so coming and talking to other people, probably has been almost as beneficial as doing the exercise and realising that you're not the only one. (Participant 8)*

The importance of good 'therapist/instructor' interaction was noted. The instructor helped create an enjoyable and supportive atmosphere, which appeared crucial for many participants.

*She's so enthusiastic and she's pleased to see us every day, whether she feels like she is or not. She's always very welcoming and um yeah, very encouraging and you can ask her things all the time. (Participant 14)*

Important psychological benefits included a greater sense of control over their chronic condition and not feeling like you are the only one dealing with this. A supportive instructor was also

valued. Consequently, people reported improved mood, a sense of achievement and gaining a better perspective.

## DISCUSSION

This study identified three key themes from the patient data which incorporated the ability to exercise in a hydrotherapy pool, which is not achievable on land or in public swimming pools. In addition, physical and psychological benefits were reported. Physiotherapy texts provide well documented information on the biophysiological, physical and therapeutic aspects of hydrotherapy (Becker and Cole 1997, Campion 1996, Hecox 2006). When evaluating the benefits of hydrotherapy, the emphasis within the texts is on impairment, specifically muscle power, muscle tone, and range of movement (Becker and Cole 1997, Campion 1996). While some hydrotherapy texts specifically address the treatment of arthritis they tend to take a biomedical approach and focus on outcomes of reduced pain and joint swelling and improved joint movement and strength (Becker and Cole 1997, Brody and Geigle 2009). There is scant information within the texts concerning the importance of the opportunity to exercise and the psychological benefits such as those reported here.

The perceived outcomes of hydrotherapy of this study fit the biopsychosocial model of health as outlined by the International Classification of Functioning, Disability and Health (World Health Organization 2001). Consequently, outcomes of hydrotherapy should address different components of this model, specifically those mentioned in this study. As outlined in our introduction, the most commonly reported outcome measures in hydrotherapy research are the WOMAC and the VAS (Larmer et al 2014). The WOMAC measures impairment (pain during activity and stiffness) and function. However, this tool does not incorporate psychological outcomes. The pain VAS, a one-item tool measuring impairment, by definition only measures this specific symptom. Our review also showed that the Arthritis Impact Measurement Scales (AIMS) or the AIMS2 was used in five studies (Larmer et al 2014). The AIMS scales are rather long and measure many aspects that our participants did not report to be beneficial, such as dexterity, managing money and medications, and work. Other studies of hydrotherapy use so-called generic outcome measures; these can be used with people with a range of conditions (Streiner and Norman 2008) (p27-9). An example is the study by Foley et al (2003), who used the Short Form 12 mental component score to evaluate changes in mental health and showed no significant change. This may be a consequence of using a generic measure, which by definition includes questions relevant to many patients but suffers from including questions irrelevant to some (Streiner and Norman 2008).

People did not raise barriers to hydrotherapy, although they did mention that public pools are not suitable for their condition. This may be a limitation of our sampling frame, since we were particularly interested in exploring hydrotherapy benefits and therefore specifically included people who engaged in this mode of treatment. Future studies could include people who do not choose to take part in hydrotherapy to explore their perceived barriers.

Although a key strength of the study was the diversity of our sample in terms of age, time since diagnosis and joint affected, ,

all but one of our participants were from New Zealand European descent and people from other ethnic groups did not come forward to participate. New Zealand is a multicultural society with 14.6% being of Māori descent and a further 17.8% from other countries (Statistics New Zealand 2006). Their views and experiences may be different and these should be explored prior to embarking on further work.

## CONCLUSION

From this qualitative study it is evident that exercising in a hydrotherapy pool provides buoyance and warmth which enable people to feel safe, do more exercises than they would be able to do on land or a public pool, and provides them with physical and psychological benefits. Research to date has not focused on these outcomes in detail and outcome measures in such research are not specific to the outcomes found in this study. Therefore, a new hydrotherapy outcome measure would be of value to investigate the effectiveness of hydrotherapy interventions from a patient's perspective.

## KEY POINTS

- Hydrotherapy provides an opportunity to exercise, which land-based exercises do not.
- Hydrotherapy has both physical and psychological benefits for OA sufferers.
- Outcome measures used in hydrotherapy research do not adequately capture these benefits.

## ETHICS

Ethical approval was gained from Auckland University of Technology Ethics Committee (AUTEK) (reference number 11/321). Participants provided informed consent.

## DISCLOSURES

Arthritis New Zealand provided a summer studentship to allow this study to be undertaken.

## ACKNOWLEDGEMENTS

This study was supported by a summer studentship from Arthritis New Zealand (study number SS03-2011). PL and PK conceived the study, supported the focus groups and drafted the paper. JD led the focus groups and interview and carried out the first round of analysis.

## CORRESPONDING AUTHOR

Dr Peter Larmer, School of Rehabilitation and Occupation Studies, AUT University, Private Bag 92006, Auckland 1142. Tel: 09 9219180 Email: peter.larmer@aut.ac.nz

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## Appendix One

### Examples of focus group questions

Why do you come to hydrotherapy?

What do you enjoy most about attending hydrotherapy?

How do you feel after hydrotherapy?

- (Prompts)-Tired, more mobile, more or less pain

What makes you feel better/worse?

Are there any barriers to attending hydrotherapy?

- (Prompts)-costs, transport, temperature of the pool

How challenging is hydrotherapy?

How do you feel following hydrotherapy compared to other physical activities such as walking or gardening?

Would you recommend hydrotherapy to other people with arthritis and why?