Research Report

Examining Compliance, Barriers and Facilitators to Ongoing Aquatic Exercise Post Discharge from Hospital Outpatient Aquatic Therapy

Wendy Phillpotts, BShty
Petrea Cornwell, BSpPath(Hons) PhD
Terry Haines, BPhtyHons, PhD,
G Cert Health Economics

Wendy Phillpotts, BPhty is a Clinical physiotherapist, Princess Alexandra Hospital, Brisbane, Queensland, Australia; Sinnamon village Day Therapy Centre, Sinnamon Park, Brisbane Queensland Australia. Address all correspondence to Ms. Phillpotts at w.phillpotts@wmb.org.au

Petrea Cornwell, BSpPath(Hons) PhD is a Research Fellow in Speech Pathology, Princess Alexandra Hospital, Brisbane, Queensland, Australia; School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane, Australia.

Terry Haines, BPhtyHons, PhD, G Cert Health Economics is a senior research fellow, Princess Alexandra Hospital, Brisbane, Queensland, Australia: School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane, Australia; Southern Health, Melbourne, Australia; Department of Physiotherapy, School of Primary Health Care, Monash University, Melbourne, Australia

Abstract

Purpose: The purpose of this study was to determine the level of compliance with a continued aquatic exercise program following discharge from a limited hospital outpatient aquatic service, and to discover patient perceptions of the barriers and facilitators to ongoing aquatic exercise in the community. **Methods:** A cross-sectional telephone survey comprising both closed and open-ended questions was conducted. Participants were 25 people who had attended a minimum of six outpatient aquatic physiotherapy sessions. Self-reported compliance with continued aquatic exercise, and descriptions of barriers and facilitators to this were recorded. Responses to open-ended questions were recorded verbatim and thematically analysed by investigators. **Results:** Eight out of 25 participants were continuing with a community-based aquatic exercise program as instructed (30%, Wald binomial 95% confidence interval 17-52%). A range of barriers and facilitators were identified. Major themes for non-compliance included reduced perception of therapeutic outcome from aquatic physiotherapy and external constraints (e.g. transport difficulties and cost associated with access). The central theme for continued compliance was a perceived positive outcome of aquatic physiotherapy combined with ready access to a heated pool. Increasing compliance of ongoing aquatic exercise post discharge from an aquatic therapy program may require greater emphasis on educating patients as to the benefits of ongoing participation.

Key Words: aquatic physiotherapy, physical therapy, compliance, adherence, barriers, facilitators

Introduction

Aquatic Physiotherapy is well accepted as a beneficial form of treatment for a multitude of conditions. Previous research has shown that aquatic physiotherapy has improved pain[1], function[1], joint mobility[2], strength[3], and balance[4] in older adults with ankylosing spondylitis, osteoarthritis or rheumatic conditions. Furthermore, it has been demonstrated that continuation of water-based therapy is beneficial for obtaining longer-term benefits in patients with chronic conditions such as ankylosing spondylitis[2] and osteoarthritis[5].

Barriers and facilitators to exercise participation in land based physiotherapy programs have been investigated in several studies[6-9], however, less investigation has been undertaken in the area of ongoing compliance with aquatic physiotherapy. Previous research by Kang et al[10] found that 74% of older adults (with rheumatoid or steoarthritis) discontinued an independent water-based exercise program within the first six months following cessation of a six-week long supervised aquatic program. 26% continued aquatic exercise for reasons of improved physical and mental health. A later qualitative study by the same authors[11] showed that self efficacy, the belief that one is able to achieve a desired goal, and group cohesion were factors that contributed to persistence with aquatic exercise in self-paced settings. This finding contrasts with investigations by Carron and Spink[12,13] which demonstrated that the task component of land based exercise influenced adherence more than the social aspects of group cohesion amongst young American adults.

The purpose of this study was to describe the proportion of patients who continue with an aquatic exercise program following participation in a short-term program supervised by a physiotherapist, and to identify the barriers and

facilitators to ongoing participation in an aquatic exercise program. This study aims to address these two areas so that strategies to enhance compliance can be developed.

Method

Design

A cross sectional analysis was chosen to capture a sample of patients during a six month time period and examine the proportion of patients continuing with aquatic exercise and to evaluate the variables relating to adherence and non adherence. A cross-sectional telephone survey was therefore undertaken composed of both closed and open-ended question items.

Setting and participants

Participants were patients consecutively discharged from the outpatient aquatic physiotherapy service at the Princess Alexandra Hospital, Brisbane, Australia between July and December 2007. To be included in the study, participants had to be over 18 years of age, live in the Brisbane south region, have attended a minimum of six aquatic physiotherapy sessions, and were discharged from an aquatic physical therapy program at least six weeks prior. Furthermore, the reason for referral to aquatic physiotherapy had to be for treatment of a musculoskeletal condition. Participants were screened before being referred to the aquatic physiotherapy program to exclude those with severe cardiac conditions, acute infections, fever, and infective diarrhea.

Intervention

All participants were provided with a supervised six week aquatic physiotherapy treatment program consisting of one 30 minute session per week. An over-arching aim of the program was for patients to become proficient in undertaking their own program during the allotted six week treatment period with the goal of independent continuation of the program upon discharge. Specific exercises were prescribed to patients and closely supervised by the physical therapist during the six week program. Each patient was assisted in locating a pool within close geographical proximity to their place of residence that was suitable for their particular needs in terms of access and cost. Patients were provided with a printed spreadsheet of pools in their area, containing the following information: - name, address and contact details, pool temperature, and proximity of public transport. They were also shown a map to locate each pool relative to their home. Patients were verbally encouraged to investigate the pools for themselves if they required any further information. Patients were also informed that continuation of their aquatic exercises was vital to maintaining the physiological improvements made while attending the hospital-based service.

Survey Instrument /Method

The telephone interview contained three key domains: i) patient continuance of their aquatic exercise program ii) barriers to continuation of their aquatic exercise program, and iii) facilitators to continuation of their aquatic exercise program. The question set included three yes-no questions, and six open-ended questions, as well as one question with a custom developed ordinal response scaling that described level of compliance (see Table 1). Where discrete response categories were required, the interviewer would attempt to elicit the response through open questioning and infer from the response provided the most representative response category. Specific prompting was required when asking about facilitators and barriers to continuation with the aquatic physiotherapy program for example in response to I had trouble getting to my local pool, the patient may have been asked. "Was public transport available?" The patient may have replied "Yes but it didn't work out." More specific prompting was then given at this point for example "Was it the cost or the difficulty finding public transport at a suitable time?"

Procedure

Potential participants were identified from the 2007 patient database for aquatic physiotherapy at the Princess Alexandra Hospital. Fifty patients matching the inclusion criteria were treated in the outpatient physiotherapy service during the study period. Of these 50 patients, 25 could be contacted via telephone and each provided verbal consent to participate in the study. Potential participants were contacted six weeks after their discharge from the hospital-based service by the principal investigator (WP). Participant demographics (see Table 2) were collected to ensure that the inclusion and exclusion criteria were met. Telephone interviews were tape recorded for later transcription and analysis. All transcribed responses were compiled into a single Microsoft Word document.

Analysis

Tape recorded interviews were transcribed verbatim. Participants were recruited until no new additional themes for compliance or non- compliance had been identified through interview of five consecutive patients. Twenty patients stated they found aquatic exercise in the hospital outpatient setting helpful. Three did not find it helpful, and two were unsure. All 25 patients had been instructed to continue aquatic exercise in the community. Nineteen indicated they wanted to continue their program, four did not want to continue and two were not sure.

Actual compliance with aquatic physiotherapy was then separated into three groups: (1) continuing as often as instructed; (2) not continuing as often as instructed, and (3) not continuing with the program at all. Subsequently data were examined using thematic analysis 14 to draw out themes for continuing or not continuing aquatic exercise programs following discharge from a physiotherapist-supervised aquatic program. The primary researcher read through all of the responses to identify similarities and differences between responses, and develop categories. Continuation with aquatic exercise was coded as described (Table 2) and calculated as a percentage. Responses and comments were recorded and themes were developed from the categories to group together comments of a similar nature. Specific quotations were selected to represent the

essence of each theme developed. Confirmation that these quotation examples appropriately reflected the theme was gained by presenting both themes and quotations to a senior aquatic physiotherapist independent of the investigative team.

Ethics

Ethics committee approval was provided by the Princess Alexandra Hospital Human Research Ethics Committee.

Results

Initial identification of patients revealed 50 eligible patients, of which 25 were able to be contacted and provide informed verbal consent. Of these 25 patients, 12 were male and 13 were female, with a mean age of 53 years (SD = 11.7years). The most frequent diagnoses were back pain (n=12), knee pathology (n=5), and shoulder pathology (n=3) (Table2).

Each of the 25 participants identified that they had been provided with a home program following their discharge from the hospital-based aquatic therapy service. Eight of the 25 participants (32%) (Table 3)(Wald binomial 95% confidence interval: 17-52%15,16) were classified as "continuing" with their prescribed program at least once per week for the six weeks following discharge from the hospital-based service, four (Wald binomial 95% confidence interval: 5-35%16) were classified as "continuing with their program but less frequently than once per week", and 13 (Wald binomial 95% confidence interval: 33-70%16) were classified as "not continuing" with their prescribed program.

The reasons for continuing (facilitators) the community-based aquatic exercise program were grouped into two major themes **"positive perceived outcome of aquatic physiotherapy"** and **"external constraints"** (Table 3). Categories that emerged within the theme of "**positive perceived outcome of aquatic physiotherapy"** included 'health beliefs' and 'positive effect on pain and function'. Comments such as *'My experience was very positive and I have continued to improve'*, and *'It is helpful for me'* were included in the latter category.

The theme **"external constraints"** included the categories of 'access to a pool', 'cost', and 'transport'. It was interesting to note that all patients had to be prompted regarding these possible issues and that only one indicated travel distance to be a barrier. Three patients indicated cost was an issue that they were able to overcome. This perception of overcoming cost issues was related to the reliance on a relative for transportation and the belief the cost was "worth it".

Clearly the predominant theme for continuing aquatic physiotherapy was **"a positive perceived outcome of aquatic physiotherapy"**, with an experience of 'a positive effect on pain and function' being the predominant category. 'Health beliefs' and 'the experience of aquatic physiotherapy proving to be superior to land physiotherapy' also played a part. Additionally, all eight patients were able to find a suitable pool, and cost and transport issues were resolved.

Table 4 presents reasons for participants **continuing but not as often as instructed** with their aquatic **exercise.** The four participants in this group attempted their program but for various reasons did not continue. These barriers to continued aquatic exercise were grouped into four themes **"negative perception of therapeutic outcome", "health limitations" "resolution of symptoms"** and **"external constraints".**

Three categories; 'health beliefs', 'effect on pain and function', and 'experience of aquatic physiotherapy inferior to that of land exercise' contributed to the theme, **"negative perception of therapeutic outcome".** 'Cost', 'access' and 'transport' were again evident within the theme of **"external constraints". "Negative perception of therapeutic outcome"** was the most frequently mentioned theme, while **"health limitations"** (*'I can't drive for long'*), and **"resolution of symptoms"** (*'My shoulder came right'*) occurred less frequently. Interestingly **"external constraints"** were seen to play only a minor role as barriers to ongoing compliance with only one patient indicating, when prompted, that cost was a problem.

The third group of 13 patients had not continued any aquatic exercise program once their six week treatment period concluded. The barriers to continuing were grouped into three themes (Table 5), **"negative perception of therapeutic outcome", "intrinsic constraints",** and **"external constraints".** The theme **"negative perception of therapeutic outcome"** was divided into similar categories as previously seen under perception of therapeutic outcome i.e. 'health beliefs', 'effect on pain and function' and 'the experience of aquatic physiotherapy being found to be inferior to that of land exercise'. Grouped together this theme came through strongly with comments such as *'I didn't think it very worth while'* and *'I didn't really feel the need'* under the category of 'health beliefs'; and *'I felt good while in the pool but got out (of the pool) feeling the same'* included under the category 'effect on pain and function'. The theme **"external constraints"** (which again included categories of cost, access and transport) was also a strong theme for non-compliance, however, **transport** issues affected only one patient. **"Intrinsic constraints"** also played a role in providing barriers to ongoing compliance. The categories given as reasons for not continuing aquatic exercise included 'lack of motivation' (*'I just haven't gotten around to doing it'*), 'low priority given to aquatic exercise', and 'self-consciousness regarding exercising at a public pool'.

Discussion

This research examined the compliance level of ongoing community-based aquatic exercise post discharge from an outpatient aquatic physiotherapy service at a tertiary hospital. Additionally, the study examined the range of perceived barriers and facilitators to ongoing compliance. It was found that approximately one third (32%) of the patients were continuing their program at six weeks after discharge. This is slightly more than the figure of 26% found in the

study by Kang et al[10] and very similar to the figure of 34% in the 2007 study by Kang et al[11] . The two predominant facilitators of compliance were a 'positive perceived outcome of aquatic physiotherapy' combined with 'ready access to a pool'. In other words, a perception of considerable benefit in continuing the water-based program was paramount in facilitating compliance, providing the patient had access to a pool. If these two facilitators were in place it appeared that issues of cost and transport were overcome by the participants. This supports the finding by Kang et al[10] that adherence correlated with perceived improvements in health outcomes.

The group of participants who initiated their program in the community but did not continue as recommended were a small selection of the interviewed group (16%). They all had access to a pool but indicated they did not feel aquatic exercise significantly improved their pain and function, which appeared to influence their decision-making. One patient's symptoms had resolved and hence felt she no longer needed to attend. Arguably, this outcome should not be seen as non-compliance, but rather as an indicator of success of the initial treatment program. Another patient was limited by his pain and the inability to drive for long distances. In this instance, it appeared that the patient perceived any positive benefits from participating in the aquatic treatment program were negated by the negative effects of travel.

The largest group of participants (52%) did not continue any aquatic exercise program with an absence of a predominating theme as a major barrier to ongoing compliance. A negative perception of therapeutic outcome was a significant barrier with the most influential category being a lack of positive effect on pain and function. External constraints also presented as significant barriers. Three of the 13 non-compliant patients claimed they either had to travel too far to access a heated pool, or that heated pools were open only during working hours and therefore prohibited their attendance. The cost associated with pool access was given as another significant reason for non-compliance by one participant; and when prompted, another participant stated that cost was prohibitive to his continuation. One participant experienced difficulty with transport and therefore did not continue. Intrinsic constraints such as lack of motivation, busy lifestyle and lack of an exercise partner also played a role and perhaps could be overcome if the perception of therapeutic outcome increased.

Implications

Given that aquatic therapy is a beneficial form of treatment in the ongoing management of many conditions and that considerable time and cost factors are at stake, it is important to maximise the effectiveness of our aquatic programs aimed at promoting ongoing adherence in the community setting. From this study, it appears that a positive perception of therapeutic outcome is paramount to ongoing compliance and is able to minimise the impact of intrinsic and external constraints. It is therefore proposed that if a patient's perception of the positive effect of aquatic exercise can be enhanced, long term adherence will be improved, and barriers will be overcome or minimized.

Where possible it is also important to address barriers such as access, cost, and difficulties with transport. A range of measures have already been put into place at the Princess Alexandra Hospital such as a visual map showing heated pools and a resource folder that includes extra information brochures on the pools in the South Brisbane Region, with photos of some of the pools showing accessibility i.e. ramp access, or step access, availability of water wheelchairs etc. Liaison with the operators of heated pools has also been encouraged to promote the need for time slots for individual exercise programs as opposed to swim classes for children, which often occur in heated pools.

Education is important to minimise internal constraints such as lack of motivation and reduced priority given to exercise. Improved compliance may be gained by increasing the education regarding the therapeutic benefits of continued exercise. Awareness of group classes such as aqua-aerobics for older clients needs to be improved so that self consciousness regarding exercising alone can be overcome.

While effort should still be maintained to minimise the barriers mentioned, greater effort could be put in to increasing the positive perception of therapeutic outcome. This may involve showing the patient objective measures of improvement, monitoring pain levels with clear feedback to patients, and allowing certain patients a longer course of aquatic therapy. Clearly perceived benefits from therapeutic intervention is of primary importance when considering the time constraints of the individual with a busy schedule. This highlights the need for objective outcome measures to clearly demonstrate improvements.

Limitations and suggestions for further research

This study aimed to discover the barriers and facilitators for ongoing compliance with an aquatic exercise program by asking former patients open ended questions with some prompting. Clearer results may be obtained by asking all participants a set of specific questions regarding barriers so as to prompt all participants in the same way, and to better compare adherents to non adherents.

No attempt was made to determine patient self efficacy or to examine the exercise beliefs and practises prior to their commencement of this program. It is proposed that these factors are likely to have considerable effect on the participant's sustained adherence. Assessment of these variables may shed more light on why patients do not continue on with their program and enable a better approach to facilitating on-going compliance.

Patients in this study were treated individually, differing from the Korean study, Kang et al[11], where the participants completed a six week group exercise program. Given this difference the figure for adherence was surprisingly simi-

lar (32% in this study and 34% in the Korean study). This may suggest that variables other than individual and group treatment are important for adherence.

It may also be beneficial to compare across clinical groups to see if there are any significant predictors of exercise persistence. Two clear groups i.e. continuers and non-continuers, may also enable better comparison. It is acknowledged that this is a small sample and as such this study may have been unable to fully capture the range and depth of barriers and facilitators to compliance with aquatic physiotherapy. A larger sample group would provide further information, and enable more reliable figures regarding compliance level to be reported.

While 32% compliance is a reasonable outcome, it is proposed that this can be improved by using strategies that overcome identified barriers; by maximizing the positive perception of therapeutic outcome it is proposed that the barriers will be minimized. The barriers remaining can then be addressed as able. This means ensuring that the patient has the maximum opportunity to experience the therapeutic benefits of aquatic therapy through improved patient education and feedback, or allowing some patients a longer course of therapy. Continued effort should also ensure that barriers posed by internal and external constraints are minimised. Further investigation of methods to minimise the barriers, and ways to maximise the facilitators should be the focus of future research and quality improvement activities.

Conclusions

This study described the proportion of patients who continued on with an individual aquatic program in the community following discharge from a hospital-based program. It also identified a range of barriers and facilitators to ongoing compliance in an aquatic exercise program. A positive perception of therapeutic outcome was paramount in determining ongoing compliance at six weeks post discharge. Barriers included a negative perception of therapeutic outcome, external constraints (e.g. access, cost and transport issues, and internal constraints (e.g. lack of motivation, busy life style and self-consciousness regarding exercising alone). These findings provide insight into reasons for non compliance, and the basis for developing strategies aimed at facilitating better adherence to ongoing aquatic exercise.

Acknowledgements

We would like to acknowledge the help of the aquatic physiotherapy assistant in helping to locate names and addresses of potential participants. We would also like to acknowledge the use of the Princess Alexandra Research Area, telephones and recording equipment.

References

1. Hall J, Skervington SM, Maddison P, Chapman K. A randomised and controlled trial of hydrotherapy in rheumatoid arthritis, *Arthritis Care and Research.* 1996;9:206-215.
2. Hidding A, Van der Wtte L. Kester A. Dijkmans B. Moolenburgh D. Continuation of group physical therapy is necessary in ankylosing spondylitis. *Arthritis Care and Research.* 1994;7:90-96.
3. Green J, McKenna F, Refern EF, Chamberlain MA. Home exercises are as effective as outpatient hydrotherapy for osteo-arthritis of the hip, *British Journal of Rheumatology.* 1993;32:812-815.
4. Suome R, Koceja DM. Postural sway characteristics in women with lower extremity arthritis before and after and aquatic exercise intervention. *Archives of Physical Medicine and Rehabilitation.* 2000;81:780-785.
5. Belza B, Topolski T, Kinne S, Patrick DL, Ramsey SD. Does adherence make a difference? Results from a community-based aquatic exercise program. *Nursing Research.* 2002;51:285-291.
6. Newson RS, Kemps EB. Factors that promote and prevent exercise engagement in older adults. *Journal of Aging and Health.* 2007;19:470-481.
7. Sallis JF, Hovell MF, Hofstetter CR, Barrington E. Explanation of vigorous physical activity during two years using social learning variables. *Social Science and Medicine.* 1992;34:25-32.
8. Wilcox S, Ananian CD, Abbott J, Vrazel J, Ramsey C, Sharpe P, Brady T. Perceived barriers, enablers and benefits among exercising and non-exercising adults with arthritis; results from a qualitative study. *Arthritis Care and Research.* 2006;55:616-627.
9. Guerin M, Mackintosh S, Fryer C. Exercise class participation among residents in low-level residential aged care could be enhanced: a qualitative study. *Australian Journal of Physiotherapy.* 2008;54:111-117.
10. Kang HS, Ferrons CE, Kim JI, Lee EO. Influencing factors on aquatic exercise adherence and dropout in patients with arthritis. *The Journal of Rheumatology and Health* (Korean). 1999;6:317-324.
11. Kang HS, Ferrons CE, Kim MJ, Kim JI, and Lee EO. Aquatic Exercise in older Korean with Arthritis. Identifying barriers and facilitators of long term adherence. *The Journal of Gerentological Nursing.* 2007;33:48-56.
12. Carron AV, Spink KS. Team building in an exercise setting. *The Sport Psychologist.* 1993;7:8-18.
13. Spink KS, & Carron AV. The effects of team building on the adherence patterns of female exercise participants. *Journal of Sport &Exercise Psychology.* 1993;15:39-49.
14. Rice PL, Ezzy D. *Qualitative research methods: a health focus:* Melbourne Oxford University Press; 1999.
15. Lewis JR, Sauro J. When 100% Really Isn't 100%: Improving the Accuracy of Small-Sample Estimates of Completion Rates. *Journal of Usability Studies.* 2006;1:136-150.
16. Measuring Usability: Confidence Interval Calculator Available at: www.measuringusability.com/wald.html. Accessed 1.7.08

Table 1. Question set and Response coding.

What condition were you treated for?
Did you find Aquatic physiotherapy helpful?
Were you instructed to continue your program in the community?
Have you continued your physiotherapy hydrotherapy program as often as your physiotherapist had instructed you to do so since completing your program at the Princess Alexandra Hospital?
Open response and then code into one of the following 3 groups.
Yes, I have continued the program as often as instructed, if not more so.
No, I have not continued my program as frequently as instructed
No, I have not continued my program at all

Do you feel that you wanted to continue your hydrotherapy program as often as instructed?
Yes – If so, why
No – If so, why not
Were there any things that you felt helped you to continue, (or would have helped even if you did not continue – only for those who did not continue)? (Prompt with an example if patient does not spontaneously offer an appropriate response eg. it was easy to access a pool)
Were there any things that you felt impeded you, or made it difficult for you to continue? (Prompt with an example if patient does not spontaneously offer an appropriate response eg. It was difficult to access a pool)
Were there any difficulties that you were able to overcome? - If so how?
Were there any difficulties that you were unable to overcome? - If so why not?

Table 2. Patient Demographics

Phone Call number	Age (years)	Gender	Condition	Coding (key below)	Found treatment helpful	Wanted to continue
1	40	M	Neck	2	somewhat	no
2	42	M	Back	3	no	no
3	88	M	Back	3	yes	yes
4	61	F	Amputation little toe	1	yes	yes
5	51	F	Shoulder	3	yes	yes
6	48	M	Back	2	yes	yes
7	58	M	Shoulder	1	yes	yes
8	25	F	Back hip neck	3	yes	yes
9	54	F	RA	3	no	no
10	56	M	Knee	1	yes	yes
11	48	M	Back, neck, shoulder	3	yes	yes
12	48	F	Back	3	yes	yes
13	53	M	shoulder	1	yes	yes
14	62	F	R knee	3	yes	yes
15	52	M	Tumour thigh	1	yes	yes
16	39	M	Back pain	3	no	no
17	58	M	Back pain	2	somewhat	no
18	61	F	Knee	3	yes	yes
19	52	F	Shoulder	2	yes	no
20	66	F	Knee and back	3	yes	yes
21	52	F	Back	1	yes	yes
22	47	F	Back	3	yes	yes
23	45	M	Back	3	yes	yes
24	63	F	Leg	1	yes	yes
25	62	M	Knee	1	yes	yes

Coding 1 Continuing with Aquatic Physiotherapy
2 Continuing but not as often as instructed
3 Not continuing at all

Table 4. Themes and Categories for those coded as 2 – continuing but not as often as instructed (n=4/25 = 16%).

Themes and Categories of Barriers to continued aquatic exercise as often as instructed.	No. of comments	Examples (Participant number in brackets)
Theme Negative perception of therapeutic outcome **3 responses in total**		
Health beliefs	0	
Effect on pain and function.	2	*'I haven't kept going because my pain is getting worse.'(6)* *'It made me feel a hell of a lot better but an hour later it was back to the same.'(17)*
Experience of aquatic exercise inferior to that of land Exercise.	1	*'There is (a heated pool I could use) but I have preferred to do land exercises if the weather is cold.'(1)*
Theme Health limitations **1 response** *'I can't drive for long' (17)*		
Theme Resolution of symptoms **1 response** *'(I continued) for a while, then I was crook(unwell), and my shoulder came right, so I have not gone back.'(19)*		
Theme External constraints **1 response only in total**		
Patient perception of cost as a problem (Cost = cost of pool entry)	1	All patients were prompted as to whether cost was a problem. Two indicated it was not a problem (6) (19) One indicated it was a problem *'they (the pools) were expensive.'(17)*
Difficulty with access to a pool (heated pool available and within reasonable distance)	0	All patients were prompted as to whether they had experienced difficulty accessing a pool. *Three indicated that they had found a pool nearby (1)(6)(17)* *One indicated they had a home pool (1) None indicated this was a barrier*
Difficulty with transport (includes ability to drive self and cost of petrol or public transport)	0	*'No (problems getting to a pool)' (19)*

Table 3. Themes and Categories of *facilitators* for those responses coded as 1 "Continuing as instructed with aquatic exercise" (n=8/25 = 32%).

Themes and Categories of facilitators to continued Aquatic exercise	No. of comments	Examples of quotations (Participant number in brackets)
Theme 1 Positive perceived outcome of Aquatic Physiotherapy, 9 responses in total		
Health beliefs	1	*'It (exercise in water) was something I have always done- I couldn't walk far so I found my physical activity was in water and would go three mornings a week.....Exercise in water was a part of my lifestyle.' (4)*
Effect on pain and function	6	*'My experience was very positive and I have continued to improve... I felt such great improvement.' (10)* *'It (aquatic physiotherapy) was very helpful' (13)* *'It (Aquatic physiotherapy) saved my life, I can walk...it's a priority for me.'(15)* *'Oh yes (I think it is important)- I need it (aquatic physiotherapy)' (21)* *'It (aquatic physiotherapy) is helpful for me'(24)* *'I go because I want to get my knees better '(25)*
Experience of aquatic Physiotherapy superior to that of land exercise	2	*'I found hydrotherapy better than land physiotherapy'(7)* *' I couldn't walk far so I found my physical activity was in water' (4)*
Theme 2 External Constraints, 8 responses in total		
Ready access to a pool. (heated pool within reasonable distance)	8	All patients were asked whether they had been to find a suitable pool. Six had *'No (problems accessing a pool)'(4)(7)(15)(21) (24)(25)* *'Able to use a friend's pool' (13)* *'I have been travelling fifteen minutes on the freeway but it is worth it.'(10)*
Cost of pool access		Several patients were prompted re cost. Four indicated it was not a barrier. (4) (7) (10) (24) One indicated cost was a problem but had been able to use a friend's pool(13) Two indicated that their program was of such high priority that although cost was an issue, they were prepared to pay.(15)(21)
Transport (includes ability to drive self and cost)		Several patients were prompted re transport but none indicated this to be a problem. (4)(7) Some patients had a relative that could drive them to a pool (15) (24) One indicated transport was a problem but was willing to overcome this problem. *'I don't drive so I need to get a lift or take a taxi, and I have to pay but it is worth it.' (21)*

Table 5. Themes and Categories for those coded as 3 – not continuing at all (n=13/25 = 52 %).

Themes and Categories of Barriers to continued aquatic exercise	No. of comments	Examples of comments (Participant number in brackets)
Theme Negative perception of therapeutic outcome 7 responses in total		
Health Beliefs	2	*'I didn't think it was very worthwhile'(3)* *'I didn't really feel the need.'(12)*
Effect on Pain and function - Benefit of aquatic physiotherapy did not last	3	*'I got some relief for a little while'(3)* *'I felt good while in the pool but got out feeling the same.'(9)* *'It (aquatic physiotherapy) made no difference (to my pain).'(16)*
Experience of aquatic exercise inferior to that of land exercise.	2	*'I have continued my land exercises – do these every morning(3)* *'I do my land exercises three times a day and it is enough to get these in.'(5)*
Theme Intrinsic constraints 5 responses in total		
Lack of Motivation	2	*'I just haven't gotten around to doing it (aquatic exercise).'(22)* *'with work and travel I don't get around to it'(23)*
Low priority given to aquatic exercise	2	*'I have had family occasions.'(18)* *'I went away for a month immediately after, and then I was crook(unwell).'(20)*
Self consciousness re exercising at a public pool	1	*'If I had a friend to go with me I might go. I hate getting out in front of people. It's just my personal preference. (5)*
Theme External constraints 6 responses in total		
Patient perception of cost as a problem	2	*'I wanted to continue but it wasn't going to work out for me in terms of cost.'(2)* *'They (heated pools) were all too expensive.' (11)* All patients were prompted as to whether cost was a problem. Four indicated that it was not a barrier. *(3)(4)(12)(14)* *'Although the pools are expensive I would pay what was needed as I found that hydrotherapy was very helpful'(8)* *'No (it is not a problem)but sometimes the cost is off putting.'(18)*
Difficulty with access (heated pool available and within reasonable distance)	3	*'The heated pools that are in my area are not available to the public outside of working hours.'(8) 'I have been unable to find a heated pool (in my area).'(14)* *'There is no pool close enough' (23)* Several patients were prompted as whether there was a pool nearby. Five replied that they did have access to a suitable pool if desired.(2)(5)(11)(20)(22)
Difficulty with transport (includes ability to drive self and cost)	1	*'Then I couldn't drive and there was no one to take me. '(22)* When prompted seven indicated that there was no issue with transport. *(5)(8)(11)(12)(14)(18)(20)*