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ORIGINAL ARTICLE

The effectiveness and satisfaction of web-based physiotherapy in people with spinal cord injury: a pilot randomised controlled trial

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Study design: A pilot randomised controlled trial.
Objectives: The aims of this study were to evaluate the effectiveness and participant satisfaction of web-based physiotherapy in people with spinal cord injury (SCI).
Setting: Community patients of a national spinal injury unit in a university teaching hospital, Scotland, UK.
Methods: Twenty-four participants were recruited and randomised to receive 8 weeks of web-based physiotherapy (intervention), twice per week, or usual care (control). Individual exercise programmes were prescribed based on participants' abilities. The intervention was delivered via a website (www.webbasedphysio.com) and monitored and progressed remotely by the physiotherapist.
Results: Participants logged on to the website an average of 1.4 ± 0.8 times per week. Between-group differences, although not significant, were more pronounced for the 6-min walk test. Participants were positive about using web-based physiotherapy and stated that they would be happy to use it again and would recommend it to others. Overall, it was rated as either good or excellent.
Conclusions: Web-based physiotherapy was feasible and acceptable for people with SCI. Participants achieved good compliance with the intervention and rated the programme highly and beneficial for health and well-being at various states after injury. The results of this study warrant further work with a more homogeneous sample.
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INTRODUCTION

Cardiovascular disease is one of the leading causes of premature death in people with spinal cord injury (SCI).[1,2] Physical activity and exercise can potentially reduce the risk of developing cardiovascular disease in people with SCI[3–5] and can help maintain or improve muscle strength and flexibility and reduce pain.[6] This results in improved health, well-being and quality of life.[7] A systematic review reported that exercise is effective in improving physical capacity and muscle strength, with no evidence to suggest that it is harmful for people after SCI.[8] Some people with SCI, however, find it difficult to exercise owing to lack of motivation or an individually tailored exercise programme coupled with issues over costs and transport.[9,10]

Home-based exercise programmes are effective in improving exercise endurance and physical activity in people with SCI.[11,12] Telerehabilitation, defined as 'the use of information and communication technology to deliver rehabilitation services over a distance',[13] may be a feasible option to enable people to exercise at home as an adjunct, or alternative, to traditional physiotherapy. Previous studies have shown that telerehabilitation is generally well received; yet few studies have been conducted investigating the effectiveness of telerehabilitation for administering home exercise for people with SCI.[14] Kowalczewski *et al.*[15] investigated a 6-week telerehabilitation programme to improve hand function in 13 people with tetraplegia in which participants were provided with a laptop, webcam and internet connection. This study found significant improvements in hand function and high participant satisfaction.[15] More recently, a 12-week exercise programme using face-to-face physiotherapy and a handout, followed by video-conferencing sessions, was investigated in 16 people with SCI complaining of sub-acromial impingement.[16] Half of the participants achieved a compliance rate of $\geqslant 50\%$ and results included reduction in pain and improved muscle strength and function.[16] The potential use of virtual games (Nintendo Wii) was investigated in a single exercise session in 10 people with SCI.[17] This study found that virtual games, particularly boxing, may provide a form of aerobic exercise. There have been no studies that have investigated physiotherapy exercise delivered via the internet for people with SCI. Our group recently developed web-based physiotherapy (www.webbasedphysio.com) and explored its use in 30 people with multiple sclerosis.[18] This study found the intervention to be feasible and acceptable with some trends towards improvement in physical ability with participants logging in an average of 1.3 times per week. The aim of the present study was to evaluate the effectiveness of web-based physiotherapy for people with SCI and the participant satisfaction with the intervention.

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METHODS

Ethical approval was obtained from the West of Scotland Research Ethics Service (ref.: 14/WS/1054). Twenty-four participants were recruited between October 2014 and June 2015 from SCI outpatient clinics at the Queen Elizabeth National Spinal Injuries Unit (QENSIU), Glasgow, Scotland. The sample size was pragmatically based on an estimated recruitment rate of 2–3 participants per month. Participants were included if they were spinal cord injured, aged >18 years, mobilising independently using a manual wheelchair or walking with/without aids, had access to a laptop, personal computer or tablet device and the internet, living within central/west of Scotland and able to read and understand English. Participants were excluded if they were already regularly exercising twice per week, pregnant or had significant comorbidity that would prevent exercise participation. Participants were randomised to either the intervention or the control group on a 2:1 ratio following baseline assessment. A random number sequence was generated in Microsoft Excel (Microsoft Corporation, Redmond, WA, USA) by an independent researcher and the numbers corresponding to intervention and control inserted into opaque sealed envelopes. There is no published protocol and registry for this pilot study.

Intervention

The website www.webbasedphysio.com was used to deliver individualised exercise programmes.[15] The website consists of exercise, exercise diary, advice and education sections. Each exercise page has a video, a written explanation of the exercise and an audio description. The website was adapted with health professionals at the QENSIU and people with SCI. Exercises suitable for people with SCI were filmed, using individuals with SCI, and uploaded onto the exercise catalogue on the website, and an advice section was developed, with the content based on the patient education provided at the QENSIU (for example, www.webbasedphysio.com log in: sciphysiopatient@gmail.com, password: password). For those in the intervention group, individualised exercise programmes were prescribed by a physiotherapist and consisted of aerobic, strengthening, stretching and balance exercises as appropriate based on participants' abilities. Participants were provided with an individual log-in to access their online exercise programme and were advised to undertake the programme, lasting approximately 30 min, a minimum of twice per week for a period of 8 weeks, and to complete their online exercise diary. Diaries were reviewed remotely by the physiotherapist who contacted participants by email or phone every 2 weeks. Progress was discussed and updates to exercise programmes were made, as appropriate, by adding/removing exercises or changing the difficulty or number of repetitions/sets.

Participants in the control group received usual care, consisting of self-management of their condition. If participants were currently exercising (for example, home-based exercise, gym or exercise class), they were asked to continue and to keep an exercise diary noting any exercise or activities in which they participated. Participants in the control group were offered access to the web-based intervention at the end of the study.

Outcome measures

Demographic information, including age, sex, time since SCI, level and completeness of injury and Spinal Cord Independence Measure III (SCIM III), were recorded. Outcome measures were recorded at baseline and at the end of the intervention period (8 weeks) by an unblinded physiotherapist at the QENSIU. The primary outcomes were the 6 Min Push Test (6MPT)[19] or the 6 min Walk Test (6MWT), depending on participants' primary means of mobility. A standardised script instructed participants to propel their wheelchair or walk as far as possible within 6 min over a 20-m straight corridor and advised that they could slow down or stop at any point during the test. The distance travelled during 6 min was recorded. Both the 6MPT and 6MWT are valid and reliable for people with SCI.[19,20] A range of secondary outcome measures were utilised. Change in heart rate (HR) (work HR − resting HR) (Polar FT2 Heart Rate Monitor, Polar, Warwick, UK) and the rate of perceived exertion using the Borg scale[21] were recorded after the 6MPT/6MWT. Muscle strength (shoulder abductors, elbow flexors/extensors, wrist extensors, hip flexors, knee extensors and ankle dorsiflexors/plantarflexors) was measured using a 'make test'[22] with a hand-held dynamometer (Manual Muscle Tester, Model 01163, Lafayette Instrument Company, Lafayette, IN, USA). This test was completed while sitting, repeated three times and the mean score was recorded. Finally, participants completed the Hospital Anxiety and Depression Scale (HADS)[23] and the World Health Organisation Quality of Life Bref Scale (WHO-QOL BREF).[24] Both questionnaires are valid and reliable for use in the SCI population.[25,26] Compliance to exercise was based on the number of days per week participants completed their exercise diary. Participants in the intervention group completed an online exercise diary, whereas those in the control group completed a paper exercise diary. After 8 weeks, participants allocated to web-based physiotherapy (intervention) completed a website evaluation questionnaire[27] and were invited to take part in a telephone interview to explore their satisfaction with the intervention.

Data analysis

Demographic variables and outcome measures were summarised by the group for each assessment with intervention effects estimated with mean and s.d. reported. All analyses were performed using IBM SPSS v22 (IBM Corp, Armonk, NY, USA). Repeated-measures analysis of variance models with Greenhouse–Geisser correction factors were used in order to assess any time, group or interaction effects. Telephone interviews were recorded, transcribed and verified. Emerging themes and subthemes were identified and agreed upon between two independent researchers.

RESULTS

Participants

Twenty-four people were recruited, 16 were allocated to the intervention group and 8 to the control group (Figure 1). All participants provided written informed consent. Participants in both groups had a wide range of injury levels (C3/4–L3) and varied in their use of mobility aids (Table 1). The control group scored higher in the SCIM III than the intervention group, indicating that they were more physically able to manage self-care tasks and required less assistance with mobility than participants in the intervention group (Table 1). One participant, allocated to the intervention group, was unable to complete the 6MPT because of an issue with their wheelchair, and one participant, allocated to the control group, was unable to complete the HR measurement and muscle strength assessment because of a skin allergy. Three participants withdrew from the study (intervention $n=1$, control $n=2$) (Figure 1). No adverse events were reported.

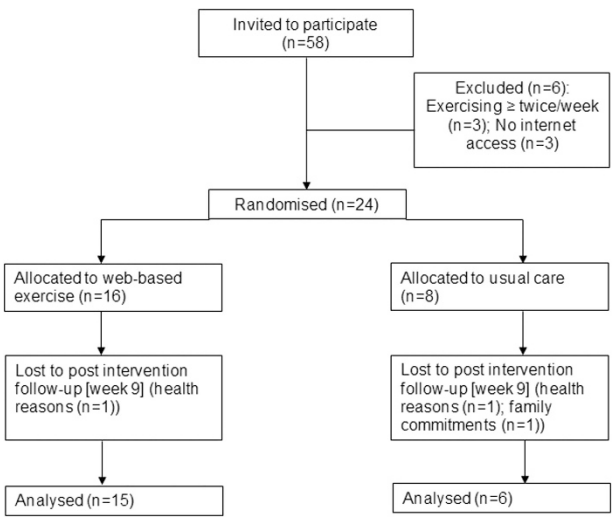

Figure 1 Consort diagram of participants randomised to the web-based intervention and usual care.

Quantitative results

There were improvements in the 6MPT and 6MWT in the intervention group. In particular, the mean distance walked during the 6MWT increased by 58 m in the intervention group, exceeding the minimal detectable change (45.8 m).[20] These results demonstrated small within-group effect sizes, which were not statistically significant. Between-group differences, although nonsignificant, were more pronounced for the 6MWT (Table 2). For the HADS, repeated-measures analysis of variance results indicated an overall time effect for the depression subscale ($P=0.038$) and group effects for the anxiety subscale ($P=0.025$) and depression subscale ($P=0.005$). In addition, there was a group effect for the WHO-QOL BREF scale ($P=0.043$). No interaction effects were found. The evaluation questionnaire revealed that participants in the intervention group had no or minimal issues with using a computer and the website, they would like to receive web-based physio again in the future, would recommend it to others and rated web-based physio as either good or excellent (Table 3).

Table 1 Characteristics of participants allocated to the intervention (web-based physio) and control (usual care) groups

	Intervention group (n = 15)	*Control group (n = 8)*
Gender		
Male	9 (56%)	5 (63%)
Female	7 (44%)	3 (38%)
Age (years)	51.5 (13.0)	48.1 (10.6)
Time since injury (years)	13 (11.6)	15.7 (9.7)
SCI level		
$C_{1–4}$	1 (6%)	1 (13%)
$C_{5–8}$	4 (25%)	5 (63%)
$T_1–S_5$	11 (69%)	2 (25%)
Complete	7 (44%)	5 (63%)
Incomplete	9 (56%)	3 (38%)
Mobility		
Manual wheelchair	10 (63%)	3 (38%)
Wheeled walker	2 (13%)	0
2 sticks/crutches	3 (19%)	2 (25%)
1 stick/crutch	0	1 (13%)
No aid	1 (6%)	2 (25%)
SCIM III (max. 100)	63.8 (13.1)	72.5 (19.0)

Abbreviations: C, cervical; F, female; M, male; S, sacral; SCI, spinal cord injury; SCIM III, spinal cord independence measure III; T, thoracic.
Values are mean (s.d.).

Compliance

Participants in the intervention group logged on to the website (www.webbasedphysio.com) an average of 1.4 ± 0.8 times per week over the 8-week period. Weekly log-ins ranged from 0 to 4 times per week. Four participants achieved a compliance rate of >100% (exercising more than twice per week). Five participants achieved a compliance rate of 50–100% (exercising 1–2 times per week). Compliance did not decrease over the 8-week intervention period, with participants logging on to the website an average of 1.6 ± 1.5 and 1.6 ± 1.8 times during weeks 1 and 8, respectively. Participants in the control group exercised an average of 0.8 ± 1.3 times per week. Two participants in the control group self-reported that they began exercising during the study period: at a gym ($n=1$) and using a home exercise programme ($n=1$).

Telephone interviews

Five themes and 10 subthemes emerged from the telephone interviews (Table 4). Participants reported using a combination of different devices to access web-based physio: personal computers ($n=2$),

Table 2 Mean (s.d.) at baseline and after 8 weeks for participants allocated to the intervention (web-based physio) and control (usual care) groups

Variable	*Baseline mean (s.d.)*	*Post mean (s.d.)*	*Mean difference (s.d.)*	*Within-group effect size*	*Between-group mean (s.d.)*	*Between-group P-value*	*Between-group 95% CI*
6MPT (m)							
Intervention ($n=7$)	547.8 (31.9)	562.1 (39.9)	14.4 (26.2)	0.40	3.5 (24.8)	0.892	−53.8, 60.7
Control ($n=3$)	359.4 (369.3)	370.3 (354.0)	10.9 (55.8)	0.03			
6MWT (m)							
Intervention ($n=7$)	239.8 (124.1)	297.7 (164.3)	57.8 (74.1)	0.40	63.5 (28.2)	0.064	−5.1, 132.1
Control ($n=3$)	232.0 (166.9)	226.3 (162.0)	−5.7 (5.3)	−0.03			
HADS_A (max 21)							
Intervention ($n=15$)	4.5 (2.7)	5.0 (3.1)	0.5 (2.4)	0.16	−0.4 (1.1)	0.735	−2.6, 1.9
Control ($n=6$)	7.7 (3.2)	8.5 (3.6)	0.8 (1.5)	0.24			
HADS_D (max 21)							
Intervention ($n=15$)	3.7 (2.8)	4.4 (3.0)	0.7(1.6)	0.23	−0.3 (0.8)	0.660	−1.9, 1.2
Control ($n=6$)	7.3 (1.4)	8.3 (1.7)	1.0 (1.3)	0.61			
WHO-QOL BREF (max 400)							
Intervention ($n=15$)	249.1 (48.9)	249.1 (39.6)	0.0 (30.5)	0.00	18.8 (13.6)	0.183	−9.7, 47.3
Control ($n=6$)	216.5 (38.8)	197.7 (34.2)	−18.8 (20.4)	−0.51			

Abbreviations: HADS_A, hospital anxiety and depression scale anxiety subscale; HADS_D, hospital anxiety and depression scale depression subscale; 6MPT, 6- min push test; 6MWT, 6 -min walk test; WHO-QOL BREF, world health organisation quality of life bref scale.

Table 3 Evaluation questionnaire results from participants who received web-based physio

Question	*Response (%)*
1. How complicated was it to use the computer?	
Very complicated	0
Moderately complicated	0
Slightly complicated	13
Not complicated at all	87
2. Did you have any difficulty in moving from one screen to another?	
Not at all	87
Very rarely	13
Frequently	0
All the time	0
3. How difficult was it to use the keyboard/mouse?	
Very difficult	0
Moderately difficult	0
Slightly difficult	13
Not difficult at all	87
4. Did you have any difficulties in reading text from the computer screen?	
Not at all	93
Very rarely	7
Frequently	0
All the time	0
5. Was the size of the text presented on the screen sufficient?	
Fully sufficient	93
Sufficient almost all the time	7
Sufficient some of the time	0
Not sufficient at all	0
6. Did you like the colours used on the computer screen?	
Certainly yes	47
To a large extent	47
To some extent	7
No	0
7. Did you like the audiovisual content provided by the computer?	
Certainly yes	80
To a large extent	20
To some extent	0
No	0
8. Did you get all the necessary information about using the website and computer during the initial visit?	
All information	100
Partial information	0
Very limited information	0
9. Did you come across any unknown words that were not explained?	
Very significant	0
Considerable	0
A few	0
None	100
10. How difficult were the sentences used on the website?	
Very difficult	0
Moderately difficult	0
Slightly difficult	0
Not difficult at all	100
11. How much new information did you get using the website?	
Very significant amount	20
Considerable	60
Little	13
Very little	7
12. Did you get any feedback from the computer/website about your training progress?	
All the time	7
Occasionally	40
Very rarely	13
Never	40
13. How frequently did you find the information/instructions on the website confusing?	
Very frequently	0
Occasionally	0
Very rarely	27
Never	87
14. How frequently did you find the contents (information/instructions) difficult to understand?	
Very frequently	0
Occasionally	0
Very rarely	13
Never	87
15. Did you have to wait for new information to come up on the screen?	
All the time	0
Occasionally	0
Very rarely	7
Never	93
16. Would you like to use this programme in the future?	
Certainly yes	87
To a large extent	13
To some extent	0
No	0
17. Would you advise other patients to use this programme?	
Certainly yes	87
To a large extent	13
To some extent	0
No	0
18. Overall how would you grade this programme?	
Needs serious improvement	0
Needs some improvement	0
Good	40
Excellent	60

laptops ($n=5$), tablet devices ($n=7$) and smart phones ($n=3$). All participants reported that the website was 'easy to use'. A small number of participants reported minor 'issues encountered' (Table 4). Regarding the exercise programme, participants found that the programme was good and that they could fit it around their work or other commitments. Participants consistently reported completing their programme twice or more times per week ($n=8$) or once per

Table 4 Qualitative results from the telephone interviews with participants receiving web-based physio intervention ($n = 13$)

Themes	*Subthemes*	*Indicative quotes*
Website use	Ease of use	'You would really have to be struggling not to be able to comprehend the processes, it's very simple, it's very well laid out so it's an easy programme to follow' SCI1 (T4/5 Complete)
	Issues encountered	'(my wife) did all the clicking, I couldn't because of my hands' SCI9 (C4 Incomplete) 'if the exercise took longer than 2 min the screen would black out, it's not a big issue, you just tap it and it comes back on. If you don't do it within the time then you need to put in your security (pin) again' SCI17 (L1 Incomplete) 'The only thing I would have occasionally was when I viewed the video it crashed my computer' SCI2 (T8/9 Complete)
Exercise programme	Participation	'Depending on what shifts I was on, I was trying to do it twice a week' SCI10 (T6 Incomplete) 'The first couple of weeks it was maybe twice. Then there were quite a few weeks at the end when I didn't do anything....I didn't participate as much as I thought I would have' SCI4 (T6/7 Complete)
	Benefits of the video	'One thing that I would say that was good is that you actually have a video of the chap or of the lady actually doing the exercise. The fact that you could watch someone do the exercise before doing it yourself was very helpful' SCI7 (C5 Incomplete) 'It reminded me just to keep the speed down, and go the pace that they are going rather than the pace that I think I should be going, you know, to remind myself that it wasn't a race!' SCI23 (T7/8 Complete)
	Progression	'I reported back that if something was too easy it would be adjusted for me. It was motivational. Things that were difficult would become easier and I would report back that they were becoming easier and then you would upscale what I had to do or the weights I had to use. It helps'. SCI7 (C5 Incomplete)
Physical and psychological change		'I noticed after about 5 weeks that my shoulder pain had almost disappeared and my balance was better and I was stronger too....I feel a lot stronger and fitter, my breathing is a lot better too' SCI1 'I'm walking a bit better, I can walk further' SCIe15 (L1 Incomplete) 'I think might have seen a benefit in my fitness but I really didn't give it my all if I'm being 100% honest' SCI4 (T6/7 Complete)
Mode of delivery	Enjoyed	'I really enjoyed it' SCI7 (C5 Incomplete) It's been a really positive experience, I think I have benefitted from it and it made me do or discover that I could do more things' SCI7 (C5 Incomplete)
	Contact with physio	'It was good to get contact and to know that there was an interest being taken in how it was going and that was helpful. One thing that was good about the chats was you sort out which bits of the programme worked best for you, move them around a bit, or just discuss' SCI1 (T4/5 Complete) 'It's not just a generic site, there is someone alive at the other end, reading your notes and saying 'what about this and what about that?', that again is another motivator' SCI7 (C5 Incomplete)
	Keeping an exercise diary	I suppose it was good to see what problems you had and then either adjusted it slightly so I didn't have as many. It was more for me, it was a memory jog, cause you sometimes forget, so it was good to go back and think' SCI8 (T6/7 Incomplete) 'I left comments for her (my physio) as well, either that was easy or that was hard, to give her (the physio) a prompt to know, you know should I increase the number of reps' SCI11 (C6/7 Incomplete) 'I ticked the box.... just a couple of messages for (my physio), like the time I didn't do it (due to feeling unwell) that I would catch up. I didn't leave any comments that it was easy because, well, it wasn't. I just mainly ticked the box.' SCI7 (C5 Incomplete)
	Exercising at home	'It's good it's available then when you want it. I think those that say you should go to a gym its more for a social aspect, depending on the person's life. I can't really fit it all in to the day. To do it in the house is better for me. If I was to go to a gym I don't think I would have (done it)' SCI7 (C5 Incomplete) 'Doing this indoors and on your own is really quite useful because you can't always do things with other people. There aren't many 'like souls' about, there aren't many paraplegics of your level and can participate with you, unless you are into wheelchair basketball, which I'm not, you're left to just get on with it and wheel yourself around. So from that perspective doing it at home is really good' SCI1 (T4/5 Complete) 'It's definitely better than getting a sheet of exercise and told to go home. You know yourself, you put the sheet down and you go to look at it the day before you are due to go back to see the physio and you haven't done any of your exercises...with this, you've got half an hour, you go online and you go through them. I found that better' SCI7 (C5 Incomplete)
	Suggested changes	'Obviously there was the telephone calls and emails (from the physio).....I don't know, whether there could be a box with your comments and then a box with your response, I don't know, a bit like internet banking I guess to say you have a messages box with feedback' SCI23 (T7/8 Complete)
Future plans		'Yes, I did say I would like to keep going. I might not do it twice a week. But, some of the exercises I can do while I'm making the dinner' SCI7 (C5 Incomplete) 'For the next 2 months I'm going to keep using it then I'm going to ask my physio for a gym referral' SCI8 (T6/7 Incomplete)

week ($n=1$). Three participants reported that feeling unwell impeded their ability to exercise in the later stages of the programme, whereas one participant complied initially but later stopped the programme because of health issues. All participants stated that it was good to have a structured, varied and progressive exercise programme targeted to their needs. Participants reported that the videos were useful to remind them of the correct technique and speed of the exercise. Participants noticed some physical and psychological benefits from exercising, with improvements in pain ($n=3$), strength ($n=2$), mobility ($n=3$), flexibility ($n=1$), mood/energy ($n=2$), balance ($n=1$), confidence ($n=1$) and health ($n=1$). Three participants did not notice a benefit, but two of those noted that this may have been due to lack of compliance with the programme (Table 4). Regarding 'web-based physio as a mode of delivery', participants 'enjoyed' following the programme; they discovered that they could do more than they had previously thought, with some adding that they needed something constructive to do after discharge from the rehabilitation unit. The majority of participants liked the bi-weekly telephone and email 'contact with physio' during which they could discuss their programme and problem-solve any issues and therefore felt that this was not a generic website and it motivated them to continue. All participants were happy to exercise at home, particularly if they could not exercise outdoors because of the weather or could not attend a gym. Some participants drew comparisons with other home exercise programmes they followed in the past, stating that web-based physio was superior to printed exercise sheets and mobile phone applications because of the benefits of watching the exercise videos and the awareness that the physiotherapist could remotely monitor and progress exercises. Finally, all participants reported that they planned to continue using their web-based physiotherapy exercise programme and three participants planned to integrate other exercises into their programme or start attending a gym class (Table 4).

DISCUSSION

The results demonstrate that web-based physiotherapy is a feasible method of delivering exercise and is acceptable to people with SCI. There were no statistically significant differences found in the primary outcomes, the 6MPT and 6MWT. Despite this, the mean difference of the 6MWT exceeded the minimal detectable change, indicating a real clinical difference. The lack of statistically significant results and small effect sizes were likely due to the small and heterogeneous sample. Data from the 6MPT and 6MWT were used to calculate the sample size required for a fully powered randomised controlled trial. In order to detect a change of 60 m in either the 6MPT ($\pm$56 m) or the 6MWT ($\pm$74 m) and to achieve a power of at least 90%, at a 5% level of significance, at a recruitment ratio of 1:1, group sizes would require at least 19 and 34 participants, respectively.

The evaluation questionnaire and qualitative interviews indicate that the website was easy to use, highly rated by participants, was enjoyable to follow and beneficial in terms of health and well-being for both paraplegic and tetraplegic participants. Nine of the 15 participants who received the web-based intervention complied with the programme, completing at least one session per week. Compliance with the intervention was similar to compliance rates in other telerehabilitation interventions; for instance, Van Straaten *et al.*[13] found that 8 of the 16 participants achieved a compliance rate of $\geqslant$50%. Similarly, compliance in the present study is comparable to the compliance rate in our previous work with people with multiple sclerosis[15] and compliance to exercise in the general population, which is generally between 30% and 57%.[28] A reduction in log-in rates over time was not observed in the present study unlike previous studies[15,22]; this may be because of the relatively short intervention period.

The present study adds to the current evidence that supports the use of telerehabilitation for people with SCI and other neurological conditions.[15–17] The results of this study also corroborate with our previous work investigating web-based physio and support further development of this work.[15] Web-based physiotherapy exercise programmes can be individually prescribed, monitored remotely and adjusted. It is therefore fundamentally different from other home exercise programmes. Establishing healthy behaviours and engaging in physical activity after a SCI is important. Noreau *et al.*[29] stated that those who are encouraged to have an active lifestyle early after their SCI are more likely to continue to do so in the long term. In this study, all participants reported an intention to continue using web-based physiotherapy, with three participants planning to include other means of exercise into their routine.

This study has a number of limitations. As a pilot study, the number of participants was small, and a short intervention period may have been too short to result in significant changes. In addition, two participants in the control group regularly exercised during the intervention period. This may have affected the results of the control group. The samples were also very heterogeneous; therefore, the quantitative results should be interpreted with caution. Finally, outcome measures were only conducted before and after the 8-week intervention period; therefore, the long-term effect of the intervention and compliance is unknown.

CONCLUSION

The results of this pilot study, particularly from the evaluation questionnaire and qualitative interviews, demonstrate that web-based physiotherapy is a feasible method of delivering exercise and is acceptable to people with SCI. Participants rated the programme highly, described it as easy to use, enjoyable to follow and beneficial in terms of health and well-being for people at various stages after injury, particularly in continued rehabilitation after discharge and for long-term health maintenance. The results of this study warrant further work with a more homogeneous sample.

DATA ARCHIVING

There were no data to deposit.

CONFLICT OF INTEREST

The website, www.webbasedphysio.com, was developed by two of the authors (EHC, LP) at the University of Glasgow. However, as this is not a commercial entity there are no conflicts of interest. All the other authors declare no conflict of interest.

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