Application of nominal group technique to inform a co-design project on power-assisted exercise equipment for people with stroke

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Rationale and Aim

- Power-assisted exercise is an accessible physical activity option for people with stroke [1].
- Co-design research will advance the equipment to quantify detected user effort and align power assisted exercise with published guidelines.

The aim of this Patient Public Involvement activity was to establish priority design features and select three machines from a range of nine for software improvement.

Methods

- Nominal group technique [2] was used with expert exercise scientists and physiotherapists (n=6) and end users with stroke (n=3).
- Group discussion was followed by voucher allocation to preferred machines.
- Content analysis generated a list of specification features.
- Votes from the end user group were multiplied twofold to ensure equal representation.

1. Software & interface

A motivational display to show the user how they're performing
(Physiotherapist)

Some gamification to reduce the monotony of training
(Exercise scientist)

2. Exercise programme

The movement needs to trigger a physiological stimulus
(Exercise scientist)

The machines need to encourage me to focus on extension
(End user)

Machine		Expert	User	Total
Cross cycle		17	3 (6)	**23**
Chest and legs		14	4 (8)	**22**
Rotatory torso		8	5 (10)	**18**
Side bend stepper		3	7 (14)	**17**
Seated climber		11	2 (4)	**15**
Ab pullover		5	2 (4)	**9**
Tricep dip leg curl		2	3 (6)	**8**
Tummy crunch		0	2 (4)	**4**
Seated abductor		0	2 (4)	**4**

3. Machine & accessories

If the machines were height adjustable I could get on and off myself
(End user)

I'm a scientist rather than clinician, I'd have never thought about access!
(Exercise scientist)

4. Setting & service

I found that physio before assisted exercise helped me to reach further
(End user)

Group exercise, meeting others who are in the same boat is good
(Physiotherapist)

Findings

Emerging domains:
1) software and interface, 2) exercise programme, 3) machine and accessories, 4) setting and service.
Foci:
End users on accessibility; physiotherapists on motivational features; exercise scientists on physiological performance.

Conclusion

Nominal group technique facilitated a structured approach to Patient Public Involvement. All attendees emphasised the importance of an individualised user experience.
The findings enabled selection of three preferred machines for advancement and identification of user-centred priority design features.

1. Young, R., Richards, E., Darji, N., Velpula, S., Smith, C., Broom, D. & Goddard, S. (2018) Power assisted exercise for people with complex neurological impairment: A feasibility study. *International Journal of Therapy and Rehabilitation,* Vol 25 (6) p. 262-271
2. Harvey, N., & Holmes, C. A. (2012) Nominal group technique: An effective method for obtaining group consensus. *International Journal of Nursing Practice, V*ol 18 (2) p. 188-194.

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