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RESEARCH ARTICLE

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A self-management program increases the dosage of inpatient rehabilitation by 26 minutes per day: a process evaluation

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ABSTRACT

Purpose: To evaluate the implementation of a self-management program, My Therapy, designed to increase inpatient rehabilitation therapy dosage via independent practice.

Materials and methods: A process evaluation of My Therapy for adult patients admitted for rehabilitation for any condition supervised by physiotherapists and occupational therapists across eight rehabilitation wards compared usual care. Outcomes included *reach*, *dosage*, *fidelity* and *adaptation*.

Results: The mean (SD) age of the process evaluation sample ($n = 123$) was 73 (11) years with a mean (SD) length of stay of 14.0 (6.6) days. The My Therapy program *reached* 68% of participants ($n = 632/928$), and resulted in an average increase in therapy *dosage* of 26 (95% CI 12 to 40) minutes/day of independent practice. All My Therapy audited programs ($n = 28$) included body function/structure impairment-based exercises, and half ($n = 13/28$) included activity/participation-based exercises. On average, participants completed programs 1.8 (SD 1.2) times/day, which were prescribed in accordance with the My Therapy criteria, demonstrating *fidelity*. There were no between-group differences in daily steps or standing time, however, My Therapy participants spent more time sitting ($p \leq 0.05$). Implementation *adaptations* were minimal.

Conclusion: A self-management rehabilitation program was implemented with fidelity for two in three rehabilitation patients, resulting in increased therapy dosage with minimal adaptations.

IMPLICATIONS FOR REHABILITATION

- The My Therapy self-management program was implemented with good reach (68% of participants received My Therapy) across four public and private inpatient rehabilitation services.
- Under My Therapy conditions, the dosage of inpatient rehabilitation therapy participation increased by an average of 26 minutes per day, which will help close the evidence-practice gap between the current rehabilitation dosage of about 1-hour per day, and the recommended rehabilitation dosage of 3-hours per day.
- My Therapy programs most frequently included impairment-based exercises that were completed in sitting, and did not increase time spent standing and walking.
- Consideration should be given to prescribing My Therapy (content and dosage) at an optimal level to promote patient functional independence, while maintaining safety.

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Rehabilitation; self-management; process evaluation; occupational therapy; physiotherapy; My Therapy; physical activity; dosage

Introduction

Adult physical rehabilitation encompasses a range of services delivered through multidisciplinary teams, aiming to deliver person centred care using evidence based interventions and evaluating progression towards meaningful goals [1]. Rehabilitation can be delivered within traditional bed-based settings in a hospital, as well as home-based services, whereby rehabilitation is delivered to patients within the community environment [1–3]. There is evidence that rehabilitation outcomes are influenced by the amount of therapy the person receives [4] and one way to increase dosage is to increase therapy staffing levels [5]. However budgetary constraints often limit additional staffing resources, despite the known benefits and the ever increasing complexity of the inpatient rehabilitation cohort [6]. Clinicians, health service managers, and policy makers need to think creatively of ways to increase the dosage of evidence-based therapy interventions to promote functional recovery during rehabilitation. One solution to the problem of providing a sufficient dosage of therapy is through patient therapy self-management, that is, re-directing some of the idle time rehabilitation patients have between supervised therapy sessions into meaningful self-directed therapy activities [7].

An example of this is My Therapy, a consumer driven self-management program, that focuses on occupational therapy and physiotherapy exercises and tasks that can be completed

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outside of supervised therapy sessions [8]. Pilot work has shown that My Therapy can increase rehabilitation therapy participation by up to 14 min per day [8]. In 2021-22, the My Therapy intervention was evaluated via a multi-site stepped wedge cluster randomised control trial conducted over eight wards at four health services (two public and two private). The trial included 2550 (control conditions, $n = 1458$; My Therapy conditions $n = 1092$) rehabilitation participants admitted to a rehabilitation ward, as well as, 788 geriatric evaluation and management participants (control conditions, $n = 388$; My Therapy conditions $n = 400$) admitted to a rehabilitation ward giving a total of 3,338 participants (unpublished data).

Process evaluations are increasingly being used alongside clinical and economic evaluations, to help understand the factors that may positively or negatively influence trial results [9,10]. Guided by the Medical Research Council (MRC) framework, process evaluations aim to: capture reach and determine the extent the intended population came into contact with the intervention; determine the dosage and quantity of intervention delivery; determine fidelity by understanding if the intervention was delivered as intended and how it was delivered; and determine if any adaptations were required to the intervention from what was planned [10]. Process evaluations, can provide valuable insights into unexpected or unanticipated results (clinical or economic), and can provide a clear description of intervention implementation to allow the intervention to be scaled up or replicated elsewhere should desired results be achieved [10]. The aim of this study was to evaluate the reach, dosage, fidelity and adaptations of the implementation of My Therapy into inpatient rehabilitation, as part of a larger stepped wedge cluster randomised trial.

Methods

Context: My Therapy intervention

My Therapy is a "consumer driven, self-management program designed to increase the dosage of therapy participation during physical rehabilitation, through independent practice of exercise and activity, in addition to usual care" [11]. Implementation was intended to be additional to usual care, and not as a substitution of supervised therapy. My Therapy was delivered by occupational therapists and physiotherapists on the ward through provision of a subset of therapy activities to be practised independently where safe and appropriate using an online exercise prescription program PTX (www.physiotherapyexercises.com). Discussion and input from the participants, alongside occupational therapy and physiotherapy collaboration, were key to developing the individualised My Therapy programs delivered in paper format. While a recommended goal of exercise/additional therapy dosage was set by prescribing therapists, the quantity and frequency to complete activities were at the participant's discretion [11]. My Therapy is based on four criteria/pillars: i) the provision of a written self-management program (delivered electronically or in paper format); (ii) ensuring programs are documented by the therapist in the medical record; (iii) providing a feedback mechanism between the patient and the therapist (such as an activity/exercise completion tick sheet); and (iv) ensuring programs are actively monitored and progressed, as clinically indicated [12]. At a practical level, My Therapy was designed to be provided to all participants on the ward where deemed safe and appropriate by the treating occupational therapist or physiotherapist. Any additional items (such as weights) that were required for the participant to complete their program were provided for use on provision of the My Therapy program by the therapist. Recommendations were made to the participant by their treating therapist to complete the My Therapy program outside of structured therapy sessions with health professionals (e.g. occupational therapists and physiotherapists).

In the six weeks prior to cross over to My Therapy conditions, implementation preparation occurred. This allowed for education of the My Therapy intervention through formal verbal education to clinical staff, interactive group discussions to co-design local implementation strategies and provision of written explanatory materials for occupational therapy and physiotherapy staff. Other members of the rehabilitation team were engaged in the pre-implementation phase by raising awareness with their role when under My Therapy conditions, but this was limited to encouraging participants to complete their My Therapy programs and not to supervise the program. To support implementation at each of the four health services, there was regular collaboration between site co-ordinators at each of the sites through online meetings and email correspondence. This provided an opportunity for shared resources between participating sites and tailoring to meet local needs.

Study design and setting

This observational process evaluation study, completed alongside a stepped wedge cluster randomised trial, has been reported in accordance with the STROBE checklist [13]. The process evaluation was conducted from April 2021 to April 2022. The protocol for the main clinical trial and the process evaluation have been previously published [11,12]. For this process evaluation, a quantitative dominant design was used. The evaluation was undertaken in eight rehabilitation wards across two public and two private Victorian health networks in Australia, with two of the public health wards located in the community (i.e., home-based wards). Multi-site ethics approval was received from Alfred Hospital Human Research Ethics Committee (HREC) (ID: 69610), followed by site specific approvals at each of the participating health services (Alfred Hospital, ID 758/20; Eastern Health, ID S21-004-69610; Cabrini Health, ID 11-04-03-21; Healthscope via La Trobe HREC, ID 758/20).

The four study components aligned with the study aims are: i) capture *reach* and determine the extent the intended population came into contact with the intervention; ii) determine the *dosage* and quantity of intervention delivery, including the amount of supervised therapy participation as part of usual care, and My Therapy program content, mapped to the International Classification of Function (ICF) [14]; iii) determine *fidelity* (patient adherence as well as therapist engagement) by understanding if the intervention was delivered as intended, how it was delivered and physical activity levels in sitting, standing and stepping; and iv) determine if any *adaptations* were required to the intervention from what was planned (Appendix A, Supplementary Material) [11,12].

All participants included in this process evaluation were subgroups of the participants included in the stepped wedge cluster randomised trial (Figure 1). The first group (group 1), recruited to evaluate program reach, included a subgroup of participants admitted in each block of the main trial ($n = 3,338$). The second group (group 2) recruited for the evaluation of dosage and fidelity were recruited over three time points (month 1/block 1 (April 2021), 6/block 5 (September 2021) and 12/block 9 (March 2022) of the 12-month/block 9 clinical trial), and were a subgroup of group 1. The third group (group 3) recruited for a detailed

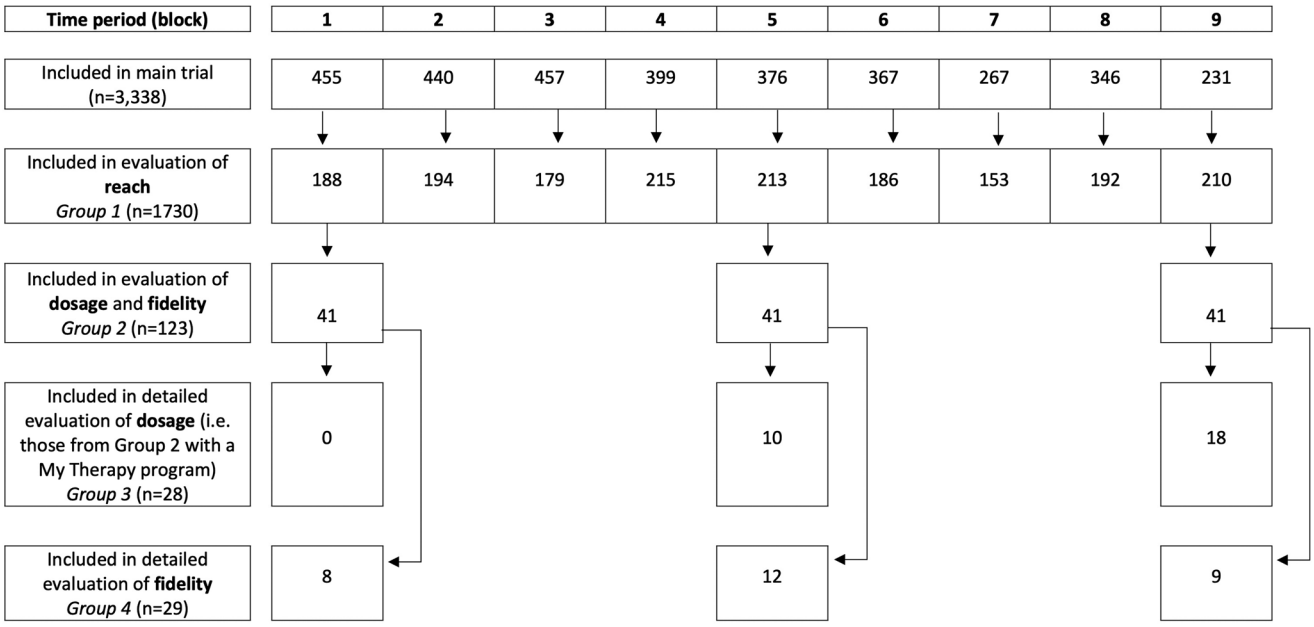

Figure 1. Participant flow.

evaluation of dosage were a subgroup of participants from group 2. The fourth group (group 4) recruited for a detailed evaluation of fidelity were a subgroup of participants from group 2.

Group 1 (reach) included all eight participating rehabilitation wards in the clinical trial, capturing all admitted participants including but not limited to diagnoses, such as orthopaedic, neurological, reconditioning, and respiratory, with and without a cognitive impairment. For group 2 (dosage and fidelity), the aim was to recruit a consecutive sample of 120 participants already consented to the main clinical trial, meeting the eligibility criteria of being over 18 years, admitted for rehabilitation for any reason and having access to Medicare (Australian universal health care program). Participants in group 2 (dosage and fidelity), met the additional eligibility criteria of not having a cognitive impairment (limiting ability to complete data collection tools) and being English speaking. Participants were approached by a member of the research team, their involvement in the study explained and written consent was gained. For groups 3 (dosage) and 4 (fidelity), convenience sampling was used from participants already recruited in group 2 with group 3 only including participants with a My Therapy program. Participants under control conditions receiving usual care only were included in groups 1 (reach), 2 (dosage and fidelity) and 4 (fidelity).

Outcomes

Data were collected and managed using REDCap (Research Electronic Data Capture) electronic data capture tools, that were hosted at Monash University and managed by Helix [15,16].

For this process evaluation, independent groups of participants were classified as receiving usual care (during control blocks of the stepped wedge cluster randomised trial, termed control conditions) or receiving My Therapy plus usual care (during intervention blocks of the stepped wedge cluster randomised trial, termed intervention conditions). If participants completed a self-management program under the control conditions this has been called a "self-management program"; if participants completed a self-management program under the intervention conditions this has been called a "My Therapy program" with both self-management and My Therapy programs needing to meet the four My Therapy criteria/pillars [12]. It was recognised that some participants may not agree to participate in a My Therapy program or be unable to be provided a program, for example, due to safety considerations. However, the intention was that every patient on the ward would be assessed for a My Therapy program during the intervention blocks, and if appropriate, be provided with a program.

R*each*: Data collection was completed on eight participating wards across the four health services over nine time points (once every six-weeks midway through each block during the 12-month clinical trial by site co-ordinators/associate investigators). To understand the *reach* of a self-management program under control and intervention conditions, medical files were audited to determine whether a self-management program had been prescribed, supplemented with discussion with treating therapists (group 1 (reach)). My Therapy was only considered to have been implemented when all four My Therapy criteria/pillars were fulfilled. On a single day, the ward audit was completed for the participating ward, capturing all admitted participants. Within the ward audit, there were no exclusion criteria applied, thereby capturing all participants on the ward. Individual participants were not able to be identified within the ward audit. Data were uploaded by the site co-ordinator to a customised form on REDCap that was blinded to the researcher. An apriori target for reach was not set. While a 100% reach would be ideal considering the whole of ward approach, researchers recognised this may not always be achievable, and note that the My Therapy feasibility study achieved a 72% reach [8].

Dosage and fidelity were measured over three time points (month 1/Block 1 (April 2021), 6/Block 5 (September 2021) and 12/Block 9 (March 2022) of the 12-month clinical trial). Participants were classified as receiving usual care (control conditions) or receiving My Therapy plus usual care (intervention conditions).

- *Dosage:* Group 2 (dosage and fidelity) participants, were audited using the therapy timetable by capturing the scheduled and completed duration of occupational therapy and

physiotherapy sessions and delivery mode. The audit of the therapy timetable was completed by a researcher. If provided a My Therapy program, participants completed a daily written activity log capturing time spent and the number of times and the number of activities/exercises completed, as well as the recommended amounts from the therapist. The audit was completed midway through each block.

- *Fidelity:* Group 2 (dosage and fidelity) participants with a My Therapy program, the activity log described above captured My Therapy patient adherence to the prescribed program by recording the recommended amount and the number of activities and amounts actually completed. For participants with a My Therapy program, all My Therapy programs provided across the seven-day data collection period were audited to capture therapist My Therapy engagement (occupational therapy and physiotherapy prescription and frequency of review of the program). The audit was completed midway through each block.
- *Dosage:* The My Therapy programs of group 3 (dosage) participants was audited capturing the focus of the exercise/activities recommended (classified as an exercise) to address: i) body function/structure impairment tasks (e.g. strengthening exercises); or ii) activity/participation based tasks which were considered the practice of functional activities repetitively (e.g. task specific training [17] such as walking or dressing practice) according to the ICF [14]; who recommended the activities/exercises (i.e. occupational therapy or physiotherapy) and the position in which the activities were to be completed (i.e. standing, sitting, lying). The audit was completed midway through each block.
- *Fidelity:* Group 4 (fidelity) participants under control and intervention conditions, wore activity monitors capturing physical activity levels in sitting, standing and stepping. Participants were asked to wear an accelerometer-based activity monitor (activPAL, PAL Technologies Limited). Participants were asked to wear monitors for 24 hours per day over seven consecutive days. Monitors were placed on the anterior middle thigh in a zip lock bag, placed on a small piece of gauze to protect the skin and covered by a waterproof dressing

Evaluation of a*daptations*: The *adaptations* log was based on the service profile audit completed on each of the participating wards which captured any major deviations to planned implementation (once every six-weeks at the start of each block, capturing information for the previous block, Appendix A, Supplementary Material).

Bias and sample size

While all eight wards were included in the ward level evaluation, for the subgroup evaluation, a sample size of 120 participants was targeted (Figure 1). The sample size ($n = 120$) provided sufficient power to determine that 85% of participants had the factor of interest (e.g. patient compliance with the activity log) for estimating the expected proportion with 6.5% absolute precision and 95% confidence [18]. A small number of participants (based on convenience sampling) from the subgroup wore activity monitors and were included in the audit of the My Therapy content. Potential sources of bias included non-representative participants due to the additional inclusion criteria that were applied for the process evaluation. For example, participants with cognitive impairment or who were non-English speaking were included in the main clinical trial to support the whole-of-ward implementation plan, however, these same participants with cognitive impairment or who were non-English speaking were not included in the more detailed process evaluation, due to the cognitive burden of the data collection requirements and the requirement of participants to recall their experiences.

Data analysis

Descriptive statistics were used for all data, consistent with recommendations [10]. Independent group t-tests, non-parametric equivalent or chi-squared tests were used to determine differences in baseline demographics, therapy participation and presence of self-management programs between control and intervention conditions. All analyses were completed in SPSS with a significance level of $p < 0.05$.

For activity monitor data, a minimum of three valid days was required for inclusion in the analysis [19]. Non-valid days were defined as accelerometer wear time of less than 80% over a 24-hour period and non-valid days were excluded from the analysis [20]. Activity data were compared between intervention and control conditions using independent-samples Mann-Whitney U test, due to their non-normal distribution. Lying data were not extracted for data analysis as sitting time was an appropriate representation of sedentary behaviour during the day in rehabilitation.

Changes to the published process evaluation protocol

The published protocol noted that the quality of implementation would be reported as a process evaluation outcome. However, the planned aspects of quality of implementation have been incorporated into the reported outcomes of reach, dosage, fidelity and adaptations.

Results

Reach

A total of 1730 participants were included in the ward audit to evaluate program reach (control conditions ($n = 802$) and intervention conditions ($n = 928$) (group 1 (reach)). Under control conditions 1% of participants ($n = 10/802$) were provided with a self-management program, compared to 68% ($n = 632/928$) under intervention conditions (i.e., a My Therapy program) (Table 1). For the 379 participants who were not prescribed a My Therapy program while in an active My Therapy block of the stepped wedge cluster randomised trial, treating therapists deemed My Therapy was not appropriate at the time of the audit ($n = 77$, 20%); there were no active therapy goal/s or input from occupational therapy or physiotherapy ($n = 61$, 16%); the My Therapy program did not meet the criteria of being reviewed or progressed within a seven day time period by occupational therapy or physiotherapy ($n = 54$, 14%); the participant was admitted on the day of the audit, or the occupational therapy or physiotherapy assessment had not yet been completed ($n = 37$, 10%); or the usual care assessment had been completed but the My Therapy program had not yet been developed ($n = 36$, 9%).

Dosage

A total of 123 participants included in the subgroup evaluation of dosage and fidelity (group 2 (dosage and fidelity)) (Figure 1). There were 113 participants who met the eligibility criteria for

Table 1. Reach of self-management programs under control and intervention conditions (Group 1 (reach)).

	Control	Intervention	p value[a]
Total participants, n	802	928	
Participants with self-management program, n (%)	10 (1.2%)	632 (68.1%)	<0.001
Participants with a self-management program, n	10	632	
Participants with self-management programs from one discipline only (either OT or PT), n (%)	10 (100.0%)	361 (57.1%)	0.006
Participants with self-management programs with input from both OT and PT, n (%)	0 (0.0%)	271 (42.9%)	0.006
Participants with OT involvement in supervised therapy, n	766	823	
Participants with OT self-management program, n (%)	4 (0.5%)	319 (38.8%)	<0.001
Participants with PT involvement in supervised therapy, n	760	827	
Participants with PT self-management program, n (%)	6 (0.8%)	584 (70.6%)	<0.001

OT: Occupational therapy; PT: Physiotherapy.
[a]Statistical analysis conducted: Chi-squared test.

this subgroup but were not included, 63 did not participate due to the admission period being too short to enable participation; 45 declined to participate; four were medically unwell or had an acute readmission; and one did not have occupational therapy and physiotherapy input during their rehabilitation admission. Subgroup participants under control conditions had an average age of 75 (SD 11) years and 60% were female, and those under intervention conditions had an average age of 72 (SD 12.0) years and 50% were female (Table 2). Intervention ($n = 63$) and control ($n = 60$) groups were well matched for demographic and baseline factors. However, there were more participants admitted under control conditions with orthopaedic conditions (50%) compared with intervention conditions (29%). Comparing groups 2 (dosage and fidelity), 3 (dosage) and 4 (fidelity), sub-groups were similar in their characteristics, with group 2 (dosage and fidelity) being older (Table 2).

Supervised therapy participation

There were no between-group differences in the amount or frequency of supervised therapy received (Appendix B, Supplementary Material). There were also no differences between how therapy was delivered to participants based on profession, i.e., occupational therapist, physiotherapist, or allied health assistant, or mode of delivery, i.e., via a group program (Appendix B, Supplementary Material).

My Therapy participation

Under intervention conditions, 98% of participants ($n = 62/63$) had a My Therapy program (group 2 (dosage and fidelity)). My Therapy increased daily time spent participating in therapeutic activities by an average of 25.9 min compared to control conditions (95% CI 11.6 to 40.1) (Table 3). Participants with a My Therapy program ($n = 59$, $n = 3$ missing data) on average completed their self-management program two times per day on six of the seven days (Table 4). This was lower than the recommended amount of approximately three times per day by therapists (Table 4). Physiotherapists recommended more activities (mean (SD) 9.9 (7.8)) to participants as part of their My Therapy program compared to occupational therapists (mean (SD) 5.7 (6.3) over the seven day period (Table 4).

My Therapy content

A smaller subgroup (group 3 (dosage)) of 28 My Therapy programs were audited, exploring the content of the program. All audited programs included exercises addressing body function and structure impairments, and 46% included activity and participation-based exercises. Exercises addressing body function and structure impairments included strengthening ($n = 14$, 50%), or multimodal exercise (strengthening combined with one (or more of) balance, range of movement, stretching and active pressure relief) ($n = 14$, 50%). Activity-based exercises involved carrying/manipulating everyday items with upper limbs ($n = 2$, 17%), self-care tasks ($n = 4$, 33%), mobility and transfers (including wheelchair mobility) ($n = 3$, 25%) and a combination of functional mobility/transfers and self-care tasks ($n = 3$, 25%). A functional walking activity was only recommended in four programs (14%). All My Therapy programs ($n = 28/28$) included sitting exercises, and half ($n = 13/28$) included standing exercises. Regarding frequency, activities were most frequently completed in a seated position (mean (SD) 3.8 (3.4) activities) with occupational therapists recommending seated activities (mean (SD) 3 (2.8) activities) more often than physiotherapists (mean (SD) 2.1 (1.9) activities). Occupational therapists did not recommend any exercises to be completed in bed (or lying) compared to physiotherapists who did (mean (SD) 1.8 (1.9) activities). On average, 0.9 activities (SD 1.4) were completed in standing.

Fidelity

Therapist input into self-management programs

Of the 632 My Therapy programs reviewed from the full ward cohort (group 1 (reach), 43% ($n = 271/632$) were prescribed by both occupational therapists and physiotherapists with the remaining programs prescribed by only one discipline. Under control conditions, ten self-management programs were reviewed. All were prescribed by only one discipline (Table 1). On average, My Therapy programs of group 2 participants (dosage and fidelity) was modified by therapists 1.9 (SD 0.8) times during the 7-day audit period (Table 4). Occupational therapists modified the My Therapy program on average 1.3 (SD 0.7) times, compared to physiotherapists who, on average, modified the program 1.7 (SD 0.8) times during the audit period.

Patient adherence to My Therapy

My Therapy was completed less frequently and at a lower intensity than what was recommended by occupational therapists and physiotherapists (Table 4). Participants reported they were advised to complete their My Therapy programs 2.5 (SD 3.1) times/day, although participants actually completed their programs, on average, 1.8 (SD 1.2) times/day. The average number of My Therapy activities recommended to participants per day was 6.7 (SD 3.3), but participants actually completed 5.5 (SD 4.3) activities per day.

Table 2. Participant characteristics (Group 2 (dosage) (Sub-group participant characteristics); group 2 (dosage), 3 (dosage) and 4 (fidelity) (whole of sample)).

	Group 2			Whole of sample		
	Usual Care (Control conditions) ($n=60$)	My Therapy (Intervention conditions) ($n=63$)	Mean difference between Group 2 (control and intervention) (95% CI) or χ^2 (p)	Group 2 ($n=123$)	Group 3 ($n=28$)	Group 4 ($n=29$)
Age at admission (years)[†]						
Mean (SD)	74.7 (10.6)	72.2 (12.0)	2.5 (95% CI −1.6 to 6.5)	73.4 (11.3)	68.1 (11.6)	71.8 (12.4)
Range	44 to 97	45 to 89		44 to 97	45 to 86	49 to 97
Gender (n (%))[‡]						
Male	24 (40%)	31 (50%)	χ^2 =1.23 ($p=0.27$)	55 (45%)	13 (46%)	18 (62%)
Female	36 (60%)	31 (50%)		67 (55%)	15 (54%)	11 (38%)
Place of residence prior to admission, (n (%))[§]						
Private residence	60 (100%)	62 (100%)	0	122 (100%)	28 (100%)	29 (100%)
Living alone prior to admission (n (%))[#]						
Yes	25 (42%)	26 (42%)	χ^2 =0.01 ($p=0.98$)	51 (42%)	10 (36%)	12 (41%)
Rehabilitation diagnosis (n (%))						
Orthopaedic conditions						
Orthopaedic fracture	17 (28%)	9 (17%)	χ^2 =8.44 ($p=0.04$) [¶]	26 (21%)	5 (18%)	4 (14%)
Orthopaedic joint replacement	10 (17%)	5 (10%)		15 (12%)	1 (4%)	3 (10%)
Other orthopaedic/soft tissue	3 (5%)	4 (8%)		7 (6%)	2 (7%)	2 (7%)
Neurological conditions (including stroke)						
Neurological	3 (5%)	6 (12%)		9 (7%)	4 (14%)	3 (10%)
Stroke	2 (3%)	9 (17%)		11 (9%)	5 (18%)	3 (10%)
Reconditioning following medical illness or surgery						
Reconditioning following medical illness	11 (18%)	8 (15%)		19 (16%)	3 (10%)	6 (21%)
Reconditioning following surgery	4 (7%)	11 (21%)		15 (12%)	1 (4%)	0 (0%)
Other						
Cardiac	4 (7%)	1 (2%)		5 (4%)	0 (0%)	0 (0%)
COVID	0 (0%)	1 (2%)		1 (1%)	1 (4%)	1 (4%)
Falls	1 (2%)	2 (3%)		3 (3%)	2 (7%)	3 (10%)
Pain	2 (3%)	5 (8%)		7 (6%)	3 (10%)	3 (10%)
Pulmonary	1 (2%)	0 (0%)		1 (1%)	0 (0%)	1 (4%)
Other	2 (3%)	1 (2%)		3 (3%)	1 (4%)	0 (0%)
Charlson Comorbidity index (n (%))						
0	24 (40%)	21 (34%)	χ^2 =4.35 ($p=0.36$)	45 (37%)	7 (25%)	6 (21%)
1	17 (28%)	12 (19%)		29 (24%)	4 (14%)	8 (28%)
2	6 (10%)	10 (16%)		16 (13%)	5 (18%)	4 (13%)
3	3 (5%)	8 (13%)		11 (9%)	4 (14%)	3 (10%)
4+	10 (17%)	11 (18%)		21 (17%)	8 (29%)	8 (28%)
Rehabilitation classification (n (%))[††]						
Geriatric evaluation and management (GEM)	3 (5%)	5 (8%)	χ^2 =0.47 ($p=0.49$)	8 (7%)	0 (0%)	0 (0%)
Inpatient rehabilitation (IPR)	57 (95%)	57 (92%)		114 (93%)	28 (100%)	29 (100%)
Hospital funding type (n (%))						
Public	30 (50%)	34 (54%)	χ^2 =0.19 ($p=0.66$)	64 (52%)	28 (100%)	29 (100%)
Private	30 (50%)	29 (46%)		59 (48%)	0 (0%)	0 (0%)
Rehabilitation delivery model (n (%))						
Bed-based	45 (75%)	48 (76%)	χ^2 =0.02 ($p=0.88$)	93 (76%)	16 (57%)	16 (55%)
Home-based	15 (25%)	15 (24%)		30 (24%)	12 (43%)	13 (45%)
Participants with a self- management program (n (%))	7 (12%)	62 (98%)				
No self-management or My Therapy Program	53 (88%)	1 (2%)	χ^2 =93.90 ($p<0.001$)	54 (44%)	0 (0%)	12 (41%)
Self-management program / My Therapy program	7 (12%)	62 (98%)		69 (56%)	28 (100%)	17 (59%)
Place of residence following discharge, (n (%))[‡‡]						
Acute hospital (transfer)	2 (3%)	4 (7%)	χ^2 =1.35 ($p=0.75$)	6 (5%)	2 (9%)	3 (11%)
Private residence	53 (88%)	49 (87%)		102 (88%)	20 (87%)	23 (82%)
Residential care	4 (7%)	2 (4%)		6 (5%)	1 (4%)	2 (7%)
Other	1 (2%)	1 (2%)		2 (2%)	0 (0%)	0 (0%)
Rehabilitation therapy following discharge (n (%))						
Yes	47 (84%)	47 (84%)	χ^2 =1.00 ($p=0.61$)	94 (84%)	18 (78%)	22 (82%)
N/A, transferred to acute	2 (4%)	4 (7%)		6 (5%)	2 (9%)	3 (11%)
Rehabilitation length of stay (days)[##]						
Mean (SD)	13.4 (6.7)	14.6 (6.5)	−1.2	14.0 (6.6)	17.0 (6.6)	15.8 (7.0)
Range	4 to 51	4 to 35	(95% CI −3.6 to 1.2)	4 to 5	7 to 35	4 to 35

[¶]For diagnosis, between groups comparison, chi square was analysed with four categories (orthopaedic, neurological, reconditioning, other).
[†]missing data: $n=1$ (Group 2);
[‡]missing data: $n=1$ (Group 2).
[§]missing data: $n=1$ (Group 2).
[#]missing data: $n=1$ (Group 2).
[††]missing data: $n=1$ (Group 2).
[‡‡]missing data $n=7$ (Group 2); $n=5$ (Group 3); $n=1$ (Group 4).
[§§]missing data $n=11$ (Group 2); $n=5$ (Group 3); $n=2$ (Group 4).
[##]missing data: $n=7$ (Group 2); $n=5$ (Group 3); $n=1$ (Group 4).

Physical activity levels

Twenty-nine participants wore activity monitors (control conditions $n=13$; intervention conditions $n=16$) (group 4 (fidelity). While patient activity levels were similar for number of steps and standing time (minutes), participants under My Therapy conditions spent approximately two hours more time sitting per day ($p=0.05$) (Table 5).

Table 3. Amount of supervised therapy and self-management per day (Group 2 (dosage)).

	Control conditions ($n = 60$)	Intervention conditions ($n = 63$)[¶]	Mean difference (95% CI)
Time spent completing supervised therapy and self-management per day (minutes)			
Mean (SD)	72.7 (37.3)	98.6 (40.9)	25.9
Range	15.0 to 153.0	0.0 to 195.0	(11.6 to 40.1)
Time spent completing supervised therapy per day (minutes)			
Mean (SD)	68.8 (38.0)	68.7 (34.9)	−0.1
Range	10.7 to 153.0	0 to 145.7	(-13.4 to 13.3)
Time spent completing self-management per day (minutes)			
Mean (SD)	3.9 (14.3)	29.3 (21.2)	25.4
Range	0.0 to 90.0	0.0 to 85.7	(18.8 to 31.9)

[¶]Excluding missing participant data ($n = 5$). For this analysis, missing data was excluded.

Adaptations to My Therapy implementation

There were three key adaptations to the planned implementation of My Therapy, as follows [11]:

1. Due to COVID-19, there were hospital visitor restrictions throughout the clinical trial. Noting that family and friends were considered as facilitators of My Therapy participation [21], this may have influenced the reach and dosage of the My Therapy intervention on the ward (Appendix C, Supplementary Material);
2. Due to COVID-19, there was a change to the rehabilitation patient profile from the start to the end of the clinical trial. This was due to the conversion of one My Therapy ward to a COVID-19 ward and substituting a Geriatric Evaluation and Management ward in its place and the cancellation of elective surgery, as part of a State response, with private hospitals acquiring more public rehabilitation patients instead;
3. Prior to the clinical trial commencing, occupational therapists identified that the online exercise platform did not contain sufficient occupational therapy exercises and tasks (as compared to physiotherapy where this was not an issue). An expert working party was established prior to trial commencement to expand the library of occupational therapy related activities. This library continued to have new activities added over the course of the trial, as requested by clinical staff.

These adaptations did influence the study design and execution of the trial during COVID-19. However, it is expected that they also influenced how My Therapy was prescribed. Notably, the altered case mix of patients possibly led to therapists having less clinical time available for patients with more complex rehabilitation needs. In addition, the absence of visitors impacted implementation for patients that required increased support with My Therapy.

Discussion

This process evaluation determined the reach, dosage, fidelity and adaptations of the implementation of the My Therapy program within a larger stepped wedge cluster randomised trial. My Therapy reached 68% of participants admitted to rehabilitation, with participants completing their programs on most days. In addition, prescription of My Therapy led to an average 26 min per day (or 182 min per week), of additional therapy participation, without compromising supervised therapy participation. All My Therapy programs included seated exercises as well as exercises addressing impairments of body function and structure, but only half of the My Therapy programs included standing exercises. The number of exercises that addressed activity and participation limitations was low ($n = 13/28$, 46%), such as task specific training (repetitive practice of a functional activity [17]). Commonly, both occupational therapists and physiotherapists contributed to developing My Therapy programs, and therapists reviewed the My Therapy programs regularly. Participant adherence to therapist-prescribed exercises and tasks was adequate. However, participants completed fewer activities and program repetitions than what therapists had prescribed. The review and feedback criterion of the My Therapy program is important to ensure that exercises remain at the appropriate level for participants as their functional level changes and to assist with compliance of program completion, particularly when self-motivation may be lacking.

Participants receiving My Therapy plus usual care had similar physical activity levels for steps and standing, when compared to usual care alone, although, participants receiving My Therapy spent almost two hours more sitting each day. The significance of this finding is uncertain as there were wide interquartile ranges from the small sample size. One possible explanation is that involvement in My Therapy may have resulted in increased amounts of time resting in sitting between My Therapy exercise sessions, or a possible partial explanation is sitting time could be attributed to the additional 26 min per day of therapy associated with My Therapy participation (noting much of the self-practice was completed in sitting). These findings need to be explored in future evaluations of My Therapy.

The COVID-19 pandemic led to clinical trial adaptations with visitor restrictions in place for the duration of the trial, resulting in little family or carer involvement in self-management programs, and fewer participants admitted following elective orthopaedic surgery under intervention, compared to control conditions. While it could be hypothesised that participants had more time to complete their My Therapy program in the absence of visitors, it is expected that the absence of visitors was detrimental to completion of the program as visitors were seen as a key enabler to My Therapy participation in the pilot work completed [21]. This is because visitors were seen to be positive social influences on the person's ability to complete the self-management program [21]. The effect of fewer participants being admitted following elective orthopaedic surgery was not formally analysed; however, this cohort of participants showed clinically significant improvements on the FIM™ as part of the pilot study [8].

My Therapy reach was based on whether the operationalised criteria were met. Therapists not meeting the review criterion was cited as a reason that the My Therapy program was not included in the audit in 54 cases, as such the assumption could be made that the therapists complied to the other criteria in the delivery of the My Therapy intervention (provision of the program in written format, documentation of the program and compliance with the feedback mechanism between the participant and therapist). Should the review criterion have been met, there could have been an improved reach of 74% of participants receiving My Therapy. Strategies to support therapists to complete the review criterion of My Therapy is important to consider to increase uptake, as an example a strategy may be reminders

Table 4. Fidelity of patients and therapists with My Therapy (Group 2 (fidelity)).

	Intervention conditions ($n = 63$)	
	Mean (SD)	Range
Patient reported engagement with My Therapy[¶]		
Days My Therapy completed		
Number of days self-management completed over audit period	5.8 (2.0)	0 to 7
Times My Therapy completed		
Number of recommended times to complete self-management over audit period (total)	17.3 (21.5)	5 to 165
Recommended times to complete self-management per day (average)	2.5 (3.1)	1 to 24
Number of times self-management completed over the audit period (total)	12.2 (8.7)	0 to 49
Number of times self-management completed per day (average)	1.8 (1.2)	0 to 7
My Therapy activities completed		
Number of activities recommended by therapist over the audit period (total)	45.4 (23.4)	14 to 148
Average number of activities recommended by therapist per day	6.7 (3.3)	2 to 21
Number of activities actually done as self-management over the audit period (total)	37.2 (29.5)	0 to 165
Average number of self-management activities done as self-management per day	5.5 (4.3)	0 to 24
Therapist engagement with My Therapy[¶]		
Number of times My Therapy modified by therapist over audit period	1.9 (0.8)	1 to 5
Occupational Therapy involvement with My Therapy		
Number of My Therapy programs with OT involvement, n	25	
Number of times OT modified program over the audit period	1.3 (0.7)	1 to 4
Number of exercises recommended by OT over the audit period	5.7 (6.3)	1 to 33
Number of times to complete program recommended by OT over the audit period	6.3 (18.3)	1 to 92
Physiotherapy involvement with My Therapy		
Number of My Therapy programs with PT involvement, n	60	
Number of times PT modified program over the audit period	1.7 (0.8)	1 to 5
Number of exercises recommended by PT over the audit period	9.9 (7.8)	2 to 44
Number of times to complete program recommended by PT over the audit period	9.5 (21.4)	1 to 149[a]

[¶]Missing participant data excluded analysis by analysis.
[a]This data had 1 outlier, and when outliers were removed, the mean was 7.2 (SD 11.24) and range was 1 to 54.

Table 5. Fidelity of participant physical activity (Group 4 (fidelity)).

	Control conditions ($n = 13$)	Intervention conditions ($n = 16$)	p value[a]
Average number of steps, per day			
Median (IQR)	619.2 (356.5 to 1896.2)	744.7 (291.4 to 1508.8)	0.90
Average standing time (minutes), per day			
Median (IQR)	72.1 (24.0 to 79.5)	87.2 (21.7 to 143.2)	0.25
Average sitting time (minutes), per day			
Median (IQR)	644.1 (544.1 to 722.0)	758.4 (636.6 to 873.9)	0.05
Average number of transfers (sit to stand)			
Median (IQR)	27.2 (22.0 to 41.0)	27.9 (13.8 to 38.9)	0.49

[a]Independent-samples Mann-Whitney U test completed.

during patient case conference discussions with wider team. The review criterion was important to ensure that the My Therapy program continued to remain appropriate for the person.

Outside of the clinical trial, and directly related to the COVID-19 pandemic, the imposed visitor restrictions and changed patient cohort are likely to have influenced the implementation success of My Therapy as there were 77 participants not appropriate for My Therapy, due to cognitive and/or physical safety concerns. If visitors (family and friends) had been available to support these participants with the My Therapy intervention, there could have been a further increase of My Therapy reach. We can speculate that if all participants were appropriate and all participants programs met the review criteria, the My Therapy reach could have been closer to 82%, recognising that at any one given point it is unlikely for a 100% reach to due to a number of reasons, including timing of admissions and assessments to enable appropriate setup of a My Therapy program. The dosage reported in this study is higher than that of the pilot study (14 min per day) [8]. Further aligning My Therapy exercise content by including more exercises that addressed activity and participation limitations, may have increased My Therapy dosage. External supports, in the form of other ward staff, family and friends, could also be viewed as facilitators for improving fidelity and dosage of the My Therapy intervention. Fidelity of program completion is likely to have been influenced by intrinsic motivation. Strategies for early identification of those with low motivation, and introducing additional supports, resources or strategies to improve motivation and participation in self-management activities may improve program compliance in line with therapist recommendations and outcomes.

Systematic reviews have shown that in general adult rehabilitation settings an additional 19 min of daily physiotherapy participation can improve function, mobility, and quality of life [22], and that in stroke rehabilitation increasing therapy participation by 100 min per day (from 30 min) can improve upper limb function [23]. The My Therapy pilot study achieved an additional 14 min of daily therapy participation [8] and the current My Therapy clinical trial achieved an additional 26 min of daily therapy participation. However, despite the additional daily rehabilitation participation attributed to My Therapy, the overall daily dosage of rehabilitation participation, inclusive of supervised therapy, (99 min) was still below the recommended three hours per day [24], and may therefore have limited impact on function, mobility, and quality of life. Therefore, it is suggested that self-management could be adopted alongside other interventions designed to increase dosage of therapy to achieve the recommended three hours per day.

When compared to the ICF, the content of My Therapy programs did not always focus on activities or participation (such as practice of self-care or domestic activities of daily living or mobility), with the focus being on impairments (such as strengthening, stretching and range of movement), nor was there an increase in standing time or step count as a result of participation [14]) and very few activities were completed in standing. A previous study on falls and balance rehabilitation found that the types of exercises prescribed were often limited by therapists' perceptions of safety and falls risk [25]. While patient safety is always paramount, this should be balanced with clinical benefit. It may be questioned whether My Therapy programs were challenging enough for participants given that most activities were completed in sitting or lying, with few targeting the individual's limitations at an activity

and participation level. A systematic review has reported that sitting exercises can lead to benefits for older people such as improved cognition and quality of life, but consistent with the principle of specificity, exercises in sitting were not associated with improved mobility [26]. Self-management programs should be aligned with evidence-based practice specific to the impairment or condition and be tailored to the patient by ensuring activities are focused on achieving patient centred goals.

Limitations and future research

Participants who were recruited for the process evaluation had different eligibility criteria to those recruited for the larger clinical trial. Specifically, participants with cognitive impairments were excluded from the process evaluation due to the cognitive demands of data collection. This may have led to sampling bias, which was highlighted by the higher percentage of participants with a self-management program in the detailed process evaluation subgroup (98%), compared to the full cohort (68%). While pilot evaluation data indicated My Therapy could be safely implemented with participants with a cognitive impairment [27], future research evaluating self-management programs for patients with cognitive impairment, in terms of amount of time spent, supports required (if any) and therapist input with self-management could be of benefit. There may also be benefit in analysing the factors differentiating patients who had a My Therapy program from those who didn't. A limitation of the analyses used in this study is that while group comparisons (control vs intervention) were considered, data clustering was not taken into account (i.e., by ward or hospital) and with the inclusion of multiple statistical testing there is an increased risk of false-positive findings. Further analyses on the effects of patient, ward and hospital characteristics on self-management prescription is being published elsewhere. Additional patient characteristics that may have influenced self-management prescription, such as ambulatory status of a participant (wheelchair bound, able to walk with a gait aid unassisted), were not captured in this evaluation. The types of activities recommended by therapists as part of the My Therapy program were only audited for descriptive purposes. However, the quality and evidence-based nature of the activities recommended as part of self-management would be worth exploring further. Focusing on the quality of the activities recommended as part of the therapy sub-set for self-management could optimise functional results for patients. Given the indicators for successful implementation in this process evaluation, future research will determine the impact of My Therapy on clinical outcomes (functional independence and health-related quality of life), rehabilitation length of stay, patient and therapist subjective experiences of My Therapy and the cost of implementing My Therapy into a rehabilitation service, to inform decision-making when scaling up the intervention to other health services and possibly to extend to implementation of the program following discharge from inpatient rehabilitation into the community setting [11]. Future iterations of the My Therapy intervention could consider further digitisation of the program, such as electronic delivery of the program with live reported feedback mechanisms to the therapist, via activity trackers.

Conclusion

A self-management program was implemented across multiple inpatient rehabilitation services with strong fidelity for the two in three participants that the program reached, increased the dosage of therapy participation, and was implemented with minimal adaptations. In the context of rehabilitation, improving therapy dosage is a desirable outcome of this evaluation. However, future iterations of the program should consider both impairment-based tasks (such as strengthening exercises), as well as activity and participation based tasks (such as activities of daily living and walking).

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Data availability statement

Upon reasonable request, individual de-identified data may be provided. Requests to be submitted to corresponding author noting that this will require separate ethics approval of the dissemination and use of the data.

References

[1] Wade DT. What is rehabilitation? An empirical investigation leading to an evidence-based description. London, England: SAGE Publications Sage UK; 2020.
[2] Langhorne P, Baylan S, Early Supported Discharge Trialists. Early supported discharge services for people with acute

stroke. Cochrane Database Syst Rev. 2017;7(7):CD000443. doi: 10.1002/14651858.CD000443.pub4.
[3] Verweij L, van de Korput E, Daams JG, et al. Effects of postacute multidisciplinary rehabilitation including exercise in out-of-hospital settings in the aged: systematic review and meta-analysis. Arch Phys Med Rehabil. 2019;100(3):530–550. doi: 10.1016/j.apmr.2018.05.010.
[4] Peiris CL, Shields N, Brusco NK, et al. Additional physical therapy services reduce length of stay and improve health outcomes in people with acute and subacute conditions: an updated systematic review and Meta-Analysis. Arch Phys Med Rehabil. 2018;99(11):2299–2312.
[5] Peiris CL, Shields N, Brusco NK, et al. Additional saturday rehabilitation improves functional independence and quality of life and reduces length of stay: a randomized controlled trial. BMC Med. 2013;11(1):198. doi: 10.1186/1741-7015-11-198.
[6] McPake B, Mahal A. Addressing the needs of an aging population in the health system: the Australian case. Health Syst Reform. 2017;3(3):236–247. doi: 10.1080/23288604.2017.1358796.
[7] Peiris CL, Taylor NF, Shields N. Additional saturday allied health services increase habitual physical activity among patients receiving inpatient rehabilitation for lower limb orthopedic conditions: a randomized controlled trial. Arch Phys Med Rehabil. 2012;93(8):1365–1370. doi: 10.1016/j.apmr.2012.03.004.
[8] Brusco NK, Tilley L, Walpole B, et al. Feasibility of increasing the dosage of inpatient occupational therapy and physiotherapy rehabilitation via independent tasks and exercises: 'My therapy. Aust Occup Ther J. 2019;66(6):739–752. doi: 10.1111/1440-1630.12614.
[9] Medical Research Council. Developing and evaluating complex interventions United Kingdom 2019 [November, 2020]. Available from: https://mrc.ukri.org/documents/pdf/complex-interventions-guidance/.
[10] Moore GF, Audrey S, Barker M, et al. Process evaluation of complex interventions medical research council guidance. BMJ: British Med J. 2015;350(mar19 6):h1258–h1258. doi: 10.1136/bmj.h1258.
[11] Brusco NK, Ekegren CL, Taylor NF, et al. Self-managed occupational therapy and physiotherapy for adults receiving inpatient rehabilitation ('My therapy'): protocol for a stepped-wedge cluster randomised trial. BMC Health Serv Res. 2021;21(1):811. doi: 10.1186/s12913-021-06462-9.
[12] Whittaker SL, Taylor NF, Hill KD, et al. Self-managed occupational therapy and physiotherapy for adults receiving inpatient rehabilitation ('My therapy'): protocol for a mixed-methods process evaluation. BMC Health Serv Res. 2021;21(1):810. doi: 10.1186/s12913-021-06463-8.
[13] von Elm E, Altman DG, Egger M, et al. Strengthening the reporting of observational studies in epidemiology (STROBE) statement: guidelines for reporting observational studies. BMJ. 2007;335(7624):806–808. doi: 10.1136/bmj.39335.541782.AD.
[14] World Health Organisation (WHO). International Classification of Functioning, Disability and Health (ICF) 2023 [4/9/2023]. Available from: https://www.who.int/standards/classifications/international-classification-of-functioning-disability-and-health.
[15] Harris PA, Taylor R, Minor BL, et al. The REDCap consortium: building an international community of software platform partners. J Biomed Inform. 2019;95:103208. doi: 10.1016/j.jbi.2019.103208.
[16] Harris PA, Taylor R, Thielke R, et al. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. J Biomed Inform. 2009;42(2):377–381. doi: 10.1016/j.jbi.2008.08.010.
[17] Langhorne P, Bernhardt J, Kwakkel G. Stroke rehabilitation. Lancet. 2011;377(9778):1693–1702. doi: 10.1016/S0140-6736(11)60325-5.
[18] Dhand NK, Khatkar MS. Statulator: an online statistical calculator. Sample Size Calculator for Estimating a Single Proportion 2014 [6 April 2021]. Available from: http://statulator.com/SampleSize/ss1P.html.
[19] Ward DS, Evenson KR, Vaughn A, et al. Accelerometer use in physical activity: best practices and research recommendations. Med Sci Sports Exerc. 2005;37(11 Suppl):S582–S8.
[20] Edwardson CL, Winkler EAH, Bodicoat DH, et al. Considerations when using the activPAL monitor in field-based research with adult populations. J Sport Health Sci. 2017;6(2):162–178. doi: 10.1016/j.jshs.2016.02.002.
[21] Brusco NK, Walpole B, Kugler H, et al. Barriers and facilitators to implementing self-directed therapy activities in inpatient rehabilitation settings. Aust Occup Ther J. 2023;70(5):617–626. doi: 10.1111/1440-1630.12891.
[22] Peiris CL, Taylor NF, Shields N. Extra physical therapy reduces patient length of stay and improves functional outcomes and quality of life in people with acute or subacute conditions: a systematic review. Arch Phys Med Rehabil. 2011;92(9):1490–1500. doi: 10.1016/j.apmr.2011.04.005.
[23] Schneider EJ, Lannin NA, Ada L, et al. Increasing the amount of usual rehabilitation improves activity after stroke: a systematic review. J Physiother. 2016;62(4):182–187. doi: 10.1016/j.jphys.2016.08.006.
[24] The Royal Australasian College of Physicians. Standards for the provision of inpatient adult rehabilitation medicine services in public and private hospitals. Australasian Faculty of Rehabilitation Medicine (AFRM). Sydney. 2019. p. 19.
[25] Farlie MK, Molloy E, Keating JL, et al. Clinical markers of the intensity of balance challenge: observational study of older adult responses to balance tasks. Phys Ther. 2016;96(3):313–323. doi: 10.2522/ptj.20140524.
[26] Sexton BP, Taylor NF. To sit or not to sit? A systematic review and meta-analysis of seated exercise for older adults. Australas J Ageing. 2019;38(1):15–27.
[27] Brusco NK, Kugler H, Dufler F, et al. Including exercise self-management as part of inpatient rehabilitation is feasible, safe and effective for patients with cognitive impairment. J Rehabil Med Clin Commun. 2022;5:1000076.