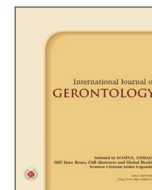




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Original Article

Feasibility of a Multicomponent Exercise Programme (EASEwell) for Hospitalised Older Adults in a Malaysian Tertiary Hospital

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SUMMARY

Background: Prolonged inactivity during acute hospitalisation is associated with physical decline and increased dependency among older adults. This study evaluated the feasibility of the Enhanced Activity for Safe Exercise-well (EASEwell) programme, an inpatient exercise intervention designed to maintain physical activity in hospitalised older adults. The programme comprised 12 supervised exercises, ranging from seated movements to functional tasks such as chair transfers and walking.

Methods: Older adults admitted for acute illness who were able to sit and walk independently, communicate with the therapist, and follow two-step commands were recruited. A physiotherapist supervised participants during the EASEwell programme. Feasibility was assessed by exercise adherence, completeness of outcome measurements, perceptions of EASEwell, and adverse events.

Results: Twenty participants (mean age 82 years; 65% female) were enrolled. The attendance rate was 88%, with a mean exercise duration of 3 ± 2 days. Most participants (96%) completed all exercise components and prescribed repetitions. Both participants and physiotherapists provided positive feedback, and no serious adverse events occurred.

Conclusion: The EASEwell programme was found to be feasible, well-received, and safe among hospitalised older adults.

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1. Introduction

Hospitalisation of older adults for acute medical illnesses presents complex challenges that extend beyond the immediate condition. Prolonged bed rest and inactivity can result in muscle atrophy, functional decline, cognitive impairment, and increased dependency.^{1,2} A systematic review by Fazio et al. reported that hospitalised older patients spent 87–100% of their time sedentary, with an average of 70 minutes per day standing or walking.³ Hospital environments, which prioritise medical care and rest, inadvertently promote inactivity.^{4,5} This is compounded by the absence of structured exercise programmes⁶ and limited guidance from healthcare workers on the importance of mobility.^{4,5,7,8}

Evidence indicates that tailored exercise interventions in acute hospital settings may prevent functional decline and reduce the risk of Hospital-Associated Decline (HAD).^{9–12} A narrative review by Chou et al.¹³ further supports this view, emphasising the role of exercise in preventing and potentially reversing frailty by reducing physical inactivity in older adults. However, a recent Cochrane review found that exercise had minimal impact on independence in activities of daily living or quality of life in hospitalised older medical patients.¹⁴ Implementing such interventions remains challenging, with barriers including patients' attitudes towards mobility, symptom severity, beliefs that rest is essential for recovery, fear of falling, difficulty navigating the hospital environ-

ment, the presence of lines or drains, cognitive impairment, and environments unsupportive of physical activity.^{8,15–17}

Although structured, multicomponent exercise interventions during hospitalisation have improved mobility, strength, and functional outcomes in older adults,^{9–12,14} most studies have been conducted in high-income countries. Hospitals in low- and middle-income countries, like Malaysia, may face staffing and equipment constraints. In Malaysia, exercise interventions are not routinely integrated into acute hospital care for older adults, and cultural expectations that patients should rest during illness raise further concerns about feasibility.

To address the inactivity in hospitalised older adults, a local research team developed the Enhanced Activity for Safe Exercise-well (EASEwell) programme, designed to promote physical activity and preserve functional status after hospitalisation. However, uncertainties remain regarding its acceptability and feasibility within the Malaysian cultural context. Before conducting a large-scale effectiveness trial, it is necessary to establish whether EASEwell can be delivered safely, accepted by patients and staff, and sustained in the local hospital environment. This study aims to provide essential insights that will guide the design of future trials assessing the programme's effectiveness.

2. Materials and methods

2.1. Study design

This single-arm feasibility study employed a quasi-experimental

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design without randomisation. Feasibility was assessed in terms of adherence, safety, and the ability to collect outcome data.

2.2. Study setting

The study was conducted between May and October 2022 in a 48-bed geriatric ward of an acute tertiary hospital. The ward was equipped with an inpatient gymnasium and supported by a rehabilitation team comprising four physiotherapists, five occupational therapists, and two attendants.

2.3. Ethics approval

Ethical approval was granted by the Universiti Malaya Medical Centre Medical Research Ethics Committee (Ref. no. 2021819-10490). Written informed consent was obtained from all participants prior to enrolment.

2.4. Sample size and sampling technique

As there is no standard sample size requirement for feasibility studies, a convenience sampling approach was used. Recruitment was constrained by COVID-19-related restrictions in the geriatric ward.

2.5. Participants

The inclusion criteria for participants were age ≥ 65 years, ad-

mission for acute illness, ability to sit independently for at least 10 minutes, ability to ambulate with or without aids, capacity to follow two-step commands, and ability to communicate with the therapist.

2.6. Recruitment

All patients admitted to the geriatric ward were screened by attending physiotherapists within 48 hours of admission using a standardised checklist based on the study’s inclusion and exclusion criteria. Screening involved review of medical records followed by bedside assessment. Eligible patients were approached by a research team member, provided with a participant information sheet, and given at least 24 hours to consider participation. Written informed consent was subsequently obtained by a physiotherapist prior to enrolment.

2.7. The EASEwell programme

The EASEwell programme was developed following a literature review of exercise guidelines for older adults and hospitalised older adults,¹⁸⁻²¹ expert panel consultations, and the researchers’ clinical experience. The programme comprised 12 exercises targeting endurance, strength, flexibility, balance, and coordination. Figure 1 outlines the 12 exercises, including repetitions, estimated duration, intensity, frequency, and progression. Figure 2 presents the exercise booklet, which includes pictorial and textual instructions on starting position, movements, repetitions, and progression. Blood pressure was measured before each session, with pulse rate and oxygen satu-

No	EXERCISE COMPONENT	REPETITIONS (WITH REST)	ESTIMATED DURATION (MINUTES)	EXERCISE TYPE	ESTIMATED INTENSITY	FREQUENCY	EXERCISE PROGRESS	TARGET MUSCLES	
1	Thoracic Expansion Exercise	3	1	Breathing	N/A	5 Times/week (Weekdays), can be done 1- 2 sessions/ day	N/A	Respiratory	
2	Partial sit-to-stand	8	3	Strengthening Balance & coordination	Low		10-12 repetitions (When patient is able to complete all exercise components easily in five consecutive days)	UL	
3	Standing Pivot Transfer	8	5	Strengthening Balance & coordination	Low-Moderate			LL	
4	Hand Grip	8 (each side)	2	Strengthening	Low			Trunk	
5	Ball Throw-and-catch	8	3	Strengthening Balance & coordination	Low			UL	
6	Single-leg Ball Kick	8 (each side)	3	Strengthening Coordination	Low			Trunk	
7	Full sit-to-stand	8	2	Strengthening Balance & coordination	Low- Moderate			LL	
8	Walking	8	10	Balance & coordination Endurance	Moderate			LL	
9	Shoulder Stretch	15 secs hold x 3 (each side)	5	Flexibility	Until feeling of tightness			N/A	UL
10	Overhead stretch								LL
11	Hamstring Stretch								Trunk
12	Ankle stretch								

Figure 1. A page from the EASEwell booklet shows summary on the repetition, estimated duration, intensity, frequency and exercise progression.

ration monitored during exercise. Sessions were conducted daily, except at weekends and public holidays. A physiotherapist supervised and guided participants in performing the exercises.

2.8. Feasibility measures

Feasibility outcomes included exercise adherence, completeness of clinical outcome measurement, perceptions of EASEwell, and adverse events:

- (i) Exercise adherence: Attendance, completion of all 12 exercises, and prescribed repetitions were recorded by the supervising physiotherapist using an exercise diary documenting attendance, components performed, and repetitions completed.
- (ii) Outcome measurement: Baseline and discharge assessment included the Modified Barthel Index, SARC-F, Hand Grip Strength, 5 Times Sit-to-Stand Test, and Timed Up and Go Test (Supplement 1).
- (iii) Perceptions: Participants, caregivers, and physiotherapists completed a questionnaire adapted from Bowen et al.²² assessing acceptability, demand, implementation, practicality, adaptability, integration, expansion, and limited-efficacy testing.

2.9. Data analysis

Data were stored and analysed using Microsoft Excel 2019. Descriptive statistics (mean ± SD, median [IQR], or percentage) were used to summarise demographics, illness characteristics, and feasibility outcomes:

- (1) Percentage of sessions attended, exercise completion rate, and completion of prescribed repetitions.
- (2) Positive responses to the feasibility questionnaire from participants, caregivers, and physiotherapists.
- (3) Percentage of outcome measures successfully obtained at baseline and discharge.
- (4) Reports of adverse events during or after exercise sessions.

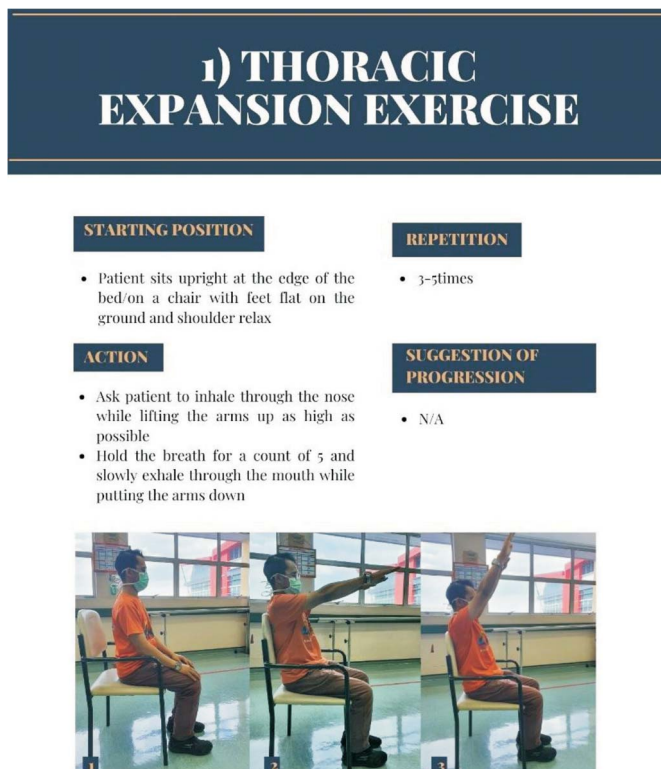


Figure 2. Example of EASEwell exercise guide describing the starting point, action, repetition and progression.

The EASEwell programme was considered feasible if ≥ 80% was achieved for each criterion.

3. Results

3.1. Study participants

During the study period, 40 patients were screened; 20 met the eligibility criteria, and consented to participate, as shown in Figure 3. Demographic and clinical characteristics are summarised in Table 1, while baseline physical characteristics are presented in Table 2.

3.2. Exercise adherence

The study demonstrated favourable outcomes for attendance, exercise completion, and prescribed repetitions (Table 3).

- (i) Attendance rate: The mean attendance rate was 88% (range: 33–100%). Sixteen participants (80%) attended more than 80% of the prescribed EASEwell sessions. The reasons for non-attendance included medical procedures such as dialysis, imaging, and fasting (n = 4), tiredness (n = 2), and low mood (n = 2).
- (ii) Exercise completion: On most days, all exercise components were completed (mean completion rate of 96%).
- (iii) Exercise repetitions: All exercise components exceeded an 80% completion rate. Exercise 8 (walking) had the lowest repetition rate, at 93%.

3.3. Measurement of outcomes

All participants completed baseline physical measures before the exercise programme. However, 40% of outcome measures were not collected at discharge, due to weekend discharges.

3.4. Perceptions of EASEwell

All respondents provided positive perceptions of the programme

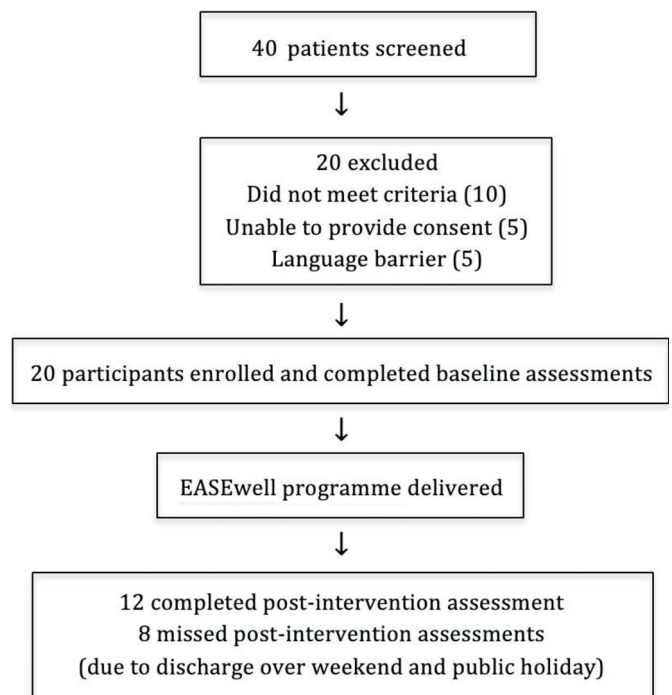


Figure 3. Flowchart of screening, enrolment, and post-intervention assessment.

in feasibility questionnaires, indicating high acceptance. Table 4 summarises physiotherapists' responses to open-ended questions on challenges, facilitators, and improvement suggestions. Physiotherapists reported improvements in participants' physical, emotional, and functional well-being. Suggested enhancements included caregiver involvement, dedicated time slots, and group exercise sessions.

3.5. Adverse events

No serious adverse events occurred during the study.

4. Discussion

This feasibility study demonstrated that the EASEwell programme is safe, well accepted, and achievable among hospitalised older adults, with an attendance rate of 88%, a component completion rate of 96%, and no serious adverse events. This is the first study

Table 1
Demographics and clinical characteristics of the participants (N = 20).

Characteristics	
Age (years), mean ± SD	82.0 ± 6.1
Gender, n (%)	
Male (M)	7 (35)
Female (F)	13 (65)
Ethnicity, n (%)	
Chinese	10 (50)
Malay	5 (25)
Indian	5 (25)
Marital status, n (%)	
Married	13 (65)
Widowed	7 (35)
Education level, n (%)	
No formal education	1 (5)
Primary	5 (25)
Secondary	9 (45)
Tertiary	5 (25)
Length of stay (days), mean ± SD	6 ± 4
Reason of admission (n, %)	
Falls	10 (50)
Infection disease	6 (30)
Cardiovascular	3 (15)
Endocrine disease	1 (5)
Comorbidities (n, %)	
1	4 (20)
2	10 (50)
> 3	6 (30)

Table 4
Physiotherapists responses to the facilitators, challenges and suggestions for improvement (N = 3).

No	Questions	Physiotherapists' responses
1	What are the motivating factors for patient to complete EASEwell program?	Patients observe other patients practicing and finishing each EASEwell component, which motivates them to challenge themselves.
2	What are the challenges to deliver the EASEwell program?	1) The high patient volume in the ward. 2) The unpredictability of patients' daily medical conditions and medical procedures like CT scan, fasting etc.
3	What are the benefits you see in patients who received EASEwell program?	Patients show improvement in their general condition, both physically and functionally.
4	Do you there is risk of fall when doing EASEwell? What can we do for fall precautions?	Patients who participate in EASEwell should always be closely supervised because the activity involves multiplanar orientation, which increases the risk of falls. Additional therapist/assistant or participation of caregivers would be good, especially for frail individuals, to reduce risk.
5	Please provide suggestions how to improve EASEwell program.	To reconsider a minimum of 3 times a week of activities throughout the weekdays, compared to daily basis. Assign patients to a group, but the activity will be delivered individually. This is to encourage other patients and to save time.

conducted in a Malaysian hospital to examine the feasibility of an exercise programme specifically designed for older adults admitted with acute illness. The exercises were intentionally selected to incorporate aerobic, resistance, balance, and functional elements, making EASEwell distinctive among inpatient exercise interventions for this population. Despite the small sample size of 20 participants, the study offers valuable insights to inform the refinement of both future study designs and the intervention itself.

The findings confirmed the feasibility of delivering EASEwell in an acute care setting. Both participants and caregivers showed willingness to engage, and adherence to daily exercises was high, supporting the potential for a larger scale trial. Participants were able to

Table 2
Baseline physical characteristic of the participants (N = 20).

Physical characteristic	N (%) / Median (IQR)
CFS	
3	6 (30)
4	6 (30)
5	4 (20)
6	4 (20)
SARC-F	
≥ 4	11 (55)
< 4	9 (45)
MBI	
Severe	2 (10)
Moderate	12 (60)
Mild	6 (30)
HGS (kg)	
Male	19 (10–26)
Female	12 (8–12)
5STS (sec)	
Male	19.4 (18.8–24)
Female	21.8 (15.5–35.3)
TUG (sec)	
Male	26.6 (20.7–57)
Female	52 (24.1–68.5)

CFS: Clinical Frailty Scale; HGS: hand grip strength; MBI: Modified Barthel Index; TUG: Timed Up and Go Test; 5STS: 5 Times Sit to Stand Test.

Table 3
Easewell exercise adherence (exercise attendance, completion of exercise components and completion of prescribed repetitions).

Exercise adherence components	Mean	Range
Attendance	88%	33–100%
Completion of all exercise components	96%	9–100%
Completion of prescribed repetitions for each exercise	96%	93–100%

complete all exercise components and prescribed repetitions within 30 minutes without experiencing adverse effects. These results suggest that EASEwell may serve as a cost-effective intervention in time-constrained acute care environments. The adherence and safety findings are consistent with those reported by Martinez-Velilla et al.²³ and Ortiz-Alonso et al.¹¹ As in Braun et al.,⁹ early discharge limited the duration of the intervention, although participants demonstrated good engagement.

Notably, this study did not apply exclusion criteria based on specific cognitive assessment scores, such as the Abbreviated Mental Test Score (AMTS) or Mini-Mental State Examination (MMSE). Instead, physiotherapists included participants who could follow instructions and interact with the therapist. In many studies, older adults with score-based cognitive impairments are excluded, limiting the evidence base for this group. Given that EASEwell exercises are straightforward, the research team deemed formal cognitive assessment unnecessary. A brief screening to determine the ability to follow simple instructions, combined with clinical judgement, was sufficient. Excluding participants solely on the basis of MMSE or AMTS scores would have omitted patients with mild cognitive impairment who could still benefit from the programme. Findings from Yang et al.²⁴ also indicated that Baduanjin, a traditional Chinese exercise characterised by low-to-moderate intensity, can be safely and effectively undertaken by older adults with cognitive impairment. These findings underscore the importance of including such patients in future research.

The EASEwell programme was designed as a daily 30-minute exercise session to meet the American College of Sports Medicine recommendation of ≥ 150 minutes of physical activity per week. The programme was delivered as one-on-one supervised exercise, enabling one physiotherapist to work with a maximum of three patients per day. Although the exercise itself required only 30 minutes, preparation, transport to and from the gymnasium, and post-session return to bed extended the total time to at least one hour, thereby limiting daily participant numbers. This feasibility study was conducted during the COVID-19 pandemic, when bed occupancy was reduced. Now that the pandemic has subsided and the 44-bed geriatric ward typically operates at full capacity, staffing constraints will need to be addressed for a full-scale trial. Possible solutions include gathering participants in a common exercise area to reduce transport time while maintaining individualised sessions. Observation of peers may provide additional motivation and enjoyment. Another option is to reduce session frequency from daily to three times per week, aligning with other studies' recommendations.^{25,26}

In this study, the mean duration of EASEwell participation was short, averaging only three days. This limited progression to higher difficulty levels. However, as the primary aim of EASEwell is to keep older adults active during hospitalisation and to preserve functional ability, the short duration is less concerning. To provide ongoing benefits, EASEwell could be adapted for home use post-discharge. Many exercises can be easily taught to caregivers, and future research could explore their active involvement. Nurses may also be engaged to assist physiotherapists in delivering the intervention.

This study also demonstrated the feasibility of measuring physical and functional outcomes despite participants' acute illnesses. Assessments such as Hand Grip Strength (HGS), Timed Up and Go Test (TUG), 5 Times Sit-to-Stand (5STS), and Modified Barthel Index (MBI) have been validated in trials involving older adults²⁷⁻³² and are suitable for future studies, as they can predict other geriatric conditions and overall physical function. In this study, only 60% of post-intervention outcomes were recorded, largely due to weekend and public holiday discharges. For a full trial, training nurses and doctors

to conduct these assessments could reduce missing data. The absence of serious adverse effects is encouraging. However, the unpredictable nature of older patients' conditions underscores the need for close monitoring during programme implementation.

To integrate the EASEwell programme into routine care in geriatric wards, physiotherapists could deliver brief, structured group exercise sessions in communal areas such as day rooms or quiet corners of the ward. Ward staff can assist in identifying appropriate participants and scheduling sessions during non-therapy hours. Simple daily activities, such as seated marching, sit-to-stand practice, and supervised walking, could also be incorporated into morning or afternoon routines. Caregivers and nursing staff can be trained to support these exercises, helping to encourage engagement and consistency. Given its low-resource requirements, the EASEwell model is particularly suitable for geriatric wards, where functional decline during hospitalisation is common, and where structured yet adaptable physical activity can meaningfully aid recovery and independence.

4.1. Strength and limitation

This study's strengths include well-defined feasibility criteria and procedures, which provide a strong foundation for future research. The use of open-ended questions enabled the collection of varied perspectives from older adults, caregivers, and healthcare professionals, offering a comprehensive view of the EASEwell programme. Importantly, participants with cognitive impairments were included, broadening the applicability of findings to a population often excluded from exercise interventions. The adaptability of the programme, including its potential modification for home use, enhances its practicality. Furthermore, the ability to maintain functional ability during hospitalisation, even with a short intervention period, underscores its potential value.

The study also has several limitations. The small sample size limits the generalisability of the findings, and the single-site setting in a tertiary hospital may not reflect outcomes in other healthcare contexts, such as primary care or community-based environments. Furthermore, the small sample size did not allow for evaluation of effectiveness, highlighting the need for larger trials. Reliance on physiotherapists to deliver the exercises and conduct assessments raises concerns about scalability, particularly in resource-limited settings where staffing may be constrained. The study was also conducted during the COVID-19 pandemic, which may have influenced intervention duration and patient outcomes due to early discharges and altered hospital routines.

Future research should address these limitations by recruiting a larger and more diverse sample, evaluating the feasibility of implementing EASEwell in varied healthcare settings, and exploring alternative delivery models, such as training nurses or caregivers to support the programme. Expanding EASEwell into a home-based format could also help ensure continuity of care and extend its benefits beyond hospitalisation.

5. Conclusion

The EASEwell exercise programme was feasible and well accepted among older adults and physiotherapists in a geriatric medical ward. It shows strong potential as an intervention to promote physical activity and improve health outcomes during hospitalisation. This feasibility study provides important insights to guide future research. To determine its effectiveness, sustainability, and cost-effectiveness, a well-designed randomised controlled trial is required.

Such studies will be essential in establishing the broader applicability and scalability of EASEwell as a standard intervention for hospitalised older adults.

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Conflicts of interest declaration

Universiti Malaya Research University Grant GPF007B-2020.

Supplementary materials

Supplementary materials for this article can be found at <https://www.sgecm.org.tw/ijge/journal/view.asp?id=37>

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