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ASSOCIATION BETWEEN EARLY IN-HOSPITAL MOBILITY AND FUNCTIONAL DECLINE AMONG OLDER ADULTS ADMITTED WITH ACUTE MEDICAL ILLNESS: A PROSPECTIVE OBSERVATIONAL COHORT STUDY

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ABSTRACT

Background: Functional decline commonly develops among older adults hospitalized with acute medical illness. Low mobility may contribute to deconditioning, loss of independence, prolonged hospitalization and adverse outcomes after discharge. The objective is to examine the association between early in-hospital mobility and functional decline among older medical inpatients.

Materials and Methods: This prospective observational cohort study included 200 adults aged 65–80 years admitted to the medical wards of Sree Balaji Medical College and Hospital, Chennai, over 15 months. Mobility was measured using time from admission to sitting out of bed, standing and walking, together with daily step count. Early mobility was defined as sitting out of bed within 24 hours and walking within 48 hours. The primary outcome was functional decline at discharge, defined as a reduction of at least 10 points in the Barthel Index from pre-admission status. Secondary outcomes included hospital length of stay, discharge destination, 30-day readmission, mortality and independent mobility.

Results: The mean age was 72.4±4.3 years, and 89 participants (44.5%) were women. Early mobility was achieved by 118 participants (59.0%). Functional decline occurred in 24 participants (20.3%) with early mobility and 34 (41.5%) with delayed mobility (p=0.001). After adjustment for age, sex, baseline Barthel Index, comorbidity, cognitive impairment, admission diagnosis, oxygen requirement, serum albumin and delirium, early mobility remained associated with lower odds of functional decline (adjusted odds ratio 0.43, 95% confidence interval 0.22–0.84; p=0.013). Median hospital stay was five days in the early-mobility group and eight days in the delayed-mobility group (p<0.001). Discharge home occurred in 89.0% and 68.3%, respectively. At 30 days, independent mobility was observed in 87.7% and 73.3%, respectively (p=0.014).

Conclusion: Early in-hospital mobility was associated with less functional decline, shorter hospitalization, more frequent discharge home and better independent mobility at 30 days. Timely mobility assessment may improve functional recovery among hospitalized older adults in practice.

Keywords: early mobility; functional decline; older adults; acute medical illness; Barthel Index; step count.

INTRODUCTION

Hospitalization for an acute medical illness is an important event in the lives of older adults and may result in deterioration of physical function even when the underlying illness is treated successfully. Functional decline during hospitalization commonly presents as a reduction in the ability to perform basic activities of daily living, including transferring, walking, toileting, dressing and feeding. Such deterioration may increase dependence on caregivers, prolong recovery, influence discharge destination and contribute to institutionalization or readmission. Older adults with lower pre-admission function, multiple comorbidities, cognitive impairment and advanced age are particularly vulnerable to hospital-associated functional decline.[1,2]

Reduced mobility is common among hospitalized older adults. Patients may spend a substantial proportion of their hospital stay in bed because of acute illness, weakness, monitoring requirements, oxygen therapy, intravenous lines, urinary catheters, pain, fear of falling or lack of assistance. Ward routines and concerns regarding patient safety may further restrict opportunities for sitting, standing and walking. Previous research has demonstrated that low mobility during hospitalization is associated with loss of independence and poorer functional outcomes at discharge and during the post-discharge period.[3,4]

The physiological consequences of inactivity may develop rapidly in older adults. Prolonged bed rest can result in reduced muscle mass and strength, impaired balance, decreased aerobic capacity, orthostatic intolerance and reduced confidence in walking.[5] These effects may be more pronounced in older patients because of reduced physiological reserve, sarcopenia, malnutrition, multiple comorbidities and pre-existing functional limitations. Acute illness may further accelerate physical deterioration through systemic inflammation, fatigue, reduced nutritional intake and decreased participation in normal daily activities.

Objective monitoring studies have shown that older adults admitted with acute medical illness generally undertake very little ambulatory activity during hospitalization.[6,7] Step-count monitoring provides a quantitative assessment of mobility and may identify clinically important differences that are not captured by routine documentation of whether a patient is ambulant or non-ambulant. Systematic evidence suggests that lower daily step counts are associated with adverse hospitalization-related outcomes, although appropriate mobility targets for different categories of acutely ill older patients remain uncertain.[8]

Mobility during hospitalization is influenced by both patient-related and hospital-related factors. Greater illness severity, cognitive impairment, delirium, oxygen dependence, malnutrition, sedative medication exposure and pre-existing disability may delay the initiation of sitting, standing and walking.[9] Consequently, the relationship between mobility and functional outcomes is complex. Patients who mobilize early may have less severe illness and better baseline function, whereas patients with delayed mobility may already be at greater risk of functional deterioration. These factors must therefore be considered when evaluating the independent association between early mobility and hospital outcomes.

Previous observational research has reported an association between early ambulation and shorter hospital stay among older adults admitted with acute illness.[10] Clinical trials have also suggested that individualized exercise and mobility interventions during acute hospitalization may help preserve functional independence in older patients.[11] However, mobility is frequently assessed as a general activity category or a single intervention. Fewer studies have simultaneously evaluated the time taken to sit out of bed, stand and walk together with objectively measured daily step counts. Evidence regarding the relationship between these mobility measures, discharge destination and short-term post-discharge outcomes also remains limited, particularly among older adults admitted to acute medical wards in the Indian hospital setting.

Early identification of patients with delayed mobility may provide an opportunity to address reversible barriers such as pain, delirium, excessive sedation, unnecessary medical devices, fear of falling, inappropriate footwear and inadequate walking assistance. Simple mobility milestones may also help clinicians recognize patients requiring early physiotherapy, nutritional support, caregiver training and discharge planning. Nevertheless, mobilization must be individualized according to haemodynamic stability, oxygen requirements, diagnosis and other clinical contraindications.

Therefore, the present prospective observational cohort study aimed to examine the relationship between early in-hospital mobility and functional decline among adults aged 65–80 years admitted with acute medical illness. Mobility was evaluated using the time from admission to sitting out of bed, standing and walking, together with the number of steps taken per day. The primary objective was to determine whether early mobility was independently associated with a lower risk of functional decline at discharge. The secondary objectives were to evaluate the associations of early mobility with length of hospital stay, discharge destination, 30-day readmission, mortality and independent mobility at 30-day follow-up.

Functional status was evaluated using the Barthel Index, a standardized instrument for assessing independence in basic activities of daily living.[12] Delirium was screened using the 4 ‘A’s Test, which has been validated for rapid delirium assessment in hospitalized older adults.[13] Comorbidity burden was quantified using the Charlson Comorbidity

Index.[14] The design and reporting of the study were guided by the Strengthening the Reporting of Observational Studies in Epidemiology recommendations for observational studies.[15]

MATERIALS AND METHODS

Study design and setting: A prospective observational cohort study was conducted in the general medical wards of Sree Balaji Medical College and Hospital, Chennai, Tamil Nadu, India. The study was conducted over 15 months. Older adults admitted with acute medical illnesses were enrolled within 24 hours of admission and followed until hospital discharge. Participants were contacted again 30 days after discharge to assess readmission, mortality and mobility status. Clinical management and decisions regarding mobilization were made by the treating medical, nursing and physiotherapy teams. The investigators did not assign or modify the patients' mobility activities.

Study Period: Participant recruitment and in-hospital data collection were conducted over 15 months, from 1 February 2025 to 1 May 2026. Each participant was followed for 30 days after hospital discharge to assess readmission, mortality and independent mobility. Follow-up of the final participant was completed by 31 May 2026.

Study population: Patients aged 65–80 years who were admitted to the medical wards with an acute medical illness were screened consecutively for eligibility. A total of 200 participants were included.

Inclusion criteria

- Were aged between 65 and 80 years.
- Were admitted to a medical ward with an acute medical illness.
- Had an expected hospital stay of at least 48 hours.
- Had been able to walk independently or with a usual walking aid before the current illness.
- Provided written informed consent personally or through a legally authorized representative.

Exclusion criteria

- Were admitted directly to an intensive care unit.
- Required invasive mechanical ventilation at enrolment.
- Had an acute stroke, major trauma or recent lower-limb fracture.
- Had undergone surgery associated with prescribed mobility restrictions.
- Had a medical condition requiring complete bed rest.
- Were completely dependent for mobility before admission.
- Could not be contacted for follow-up and had no reliable caregiver or proxy.

Sample size and sampling method: The target sample size was 200 participants. Assuming that approximately 30% of hospitalized older adults would experience functional decline, this sample size was sufficient to estimate the overall proportion with acceptable precision. It also allowed comparison between participants with early and delayed mobility. Consecutive sampling was used to reduce selection bias. All eligible patients admitted during the study period were approached until the required sample was reached.

Data collection: Baseline information was collected within 24 hours of enrolment through patient or caregiver interviews, clinical examination and medical-record review. Data were recorded using a structured case-report form. All assessments were performed by trained research personnel.

Demographic and Baseline Variables: Demographic and baseline information was collected within 24 hours of admission through patient or caregiver interviews, clinical examination and medical-record review. The variables recorded included age, sex, height, weight, body mass index, usual living arrangement, pre-existing comorbidities, cognitive status, pre-admission mobility and use of a walking aid. Functional status during the two weeks preceding the acute illness was assessed using the Barthel Index. The primary diagnosis at admission and whether the admission was emergency or planned were also documented. Comorbidity burden was determined from the participant's medical history and available clinical records.

Functional and Cognitive Assessment: Functional status was assessed using the Barthel Index, which measures independence in feeding, bathing, grooming, dressing, bowel and bladder control, toilet use, transfers, mobility and stair climbing. The pre-admission score represented the participant's usual functional ability during the two weeks preceding the acute illness and was obtained from the patient or a reliable caregiver. The assessment was repeated within 24 hours before discharge and at the 30-day follow-up. Scores ranged from 0 to 100, with higher scores indicating greater independence. Cognitive status was assessed within 24 hours of admission using the Mini-Cog assessment, and a score below 3 was considered suggestive of cognitive impairment. Previously diagnosed dementia and the source of functional information were also documented.

Clinical and Laboratory Variables: Clinical information was collected from patient interviews, examinations and medical records. The primary admission diagnosis, route of admission, comorbidities, oxygen requirement and presence of urinary catheters or intravenous lines were documented. The first laboratory results obtained within 24 hours of admission were recorded, including haemoglobin, total leukocyte count, blood urea, serum creatinine, estimated glomerular filtration rate, serum sodium and serum albumin. Oxygen requirement was recorded as present or absent, together with the delivery device and maximum flow rate. Participants were screened daily for delirium using the 4AT, with a score of 4 or more considered suggestive of delirium.

Medication Assessment: Medication reconciliation was performed within 24 hours of admission using patient or caregiver interviews, previous prescriptions and hospital records. The complete list of regular and newly prescribed medications was recorded. Polypharmacy was defined as the use of five or more regular medicines. Particular attention was given to sedatives, hypnotics, opioids, antipsychotics, anticholinergic medicines, antihypertensive agents, diuretics and glucose-lowering medications because these medicines could influence alertness, balance, blood pressure or mobility. Changes in medication exposure during hospitalization were also documented.

Assessment of In-Hospital Mobility

Mobility was assessed from the time of admission to the medical ward until discharge. Trained research personnel documented the number of hours from admission to the first occasion on which the participant sat out of bed for at least five minutes, stood upright for at least one minute and walked at least five metres beyond the bedside. The assistance required and use of a walking aid were recorded for each milestone. Daily step count was measured using a wearable step counter during waking hours, and a valid monitoring day required at least eight hours of wear time. Early mobility was defined as sitting out of bed within 24 hours and walking at least five metres within 48 hours of admission. Participants who did not meet both criteria were classified as having delayed mobility. Documented medical contraindications to mobilization were recorded separately.

Outcome Measures: The primary outcome was functional decline at hospital discharge, defined as a reduction of at least 10 points in the discharge Barthel Index compared with the pre-admission score. Secondary outcomes included change in Barthel Index as a continuous measure, hospital length of stay, discharge destination, discharge to the usual home, transfer to a rehabilitation facility or another healthcare centre, unplanned readmission within 30 days, all-cause mortality within 30 days and independent mobility at 30 days. Independent mobility was defined as the ability to walk at least 10 metres without physical assistance, with or without the participant's usual walking aid.

Follow-Up: Each participant was followed for 30 days after hospital discharge. A structured telephone interview was conducted with the participant or caregiver 30 days after discharge, with an allowable window of three days. Information was collected regarding unplanned readmission, mortality, current residence, walking assistance and Barthel Index. Hospital records were reviewed before telephone contact to identify events recorded at the study centre. At least three telephone attempts were made on different days and at different times before a participant was considered lost to follow-up. Follow-up of the final participant was completed by 31 May 2026.

Statistical Analysis: Data were analysed using IBM SPSS Statistics version 26.0. Continuous variables were assessed for normality and presented as mean with standard deviation or median with interquartile range, as appropriate. Categorical variables were presented as frequencies and percentages. The early- and delayed-mobility groups were compared using the independent-samples t-test or Mann–Whitney U test for continuous variables and the chi-square test or Fisher's exact test for categorical variables. Multivariable logistic regression was used to determine the independent association between early mobility and functional decline after adjusting for age, sex, pre-admission Barthel Index, pre-admission mobility, comorbidity burden, cognitive impairment, admission diagnosis, admission type, oxygen requirement, serum albumin, delirium and documented contraindications to mobilization. Adjusted odds ratios were reported with 95% confidence intervals. Time to walking was analysed for each 24-hour delay, while step count was analysed for each 500-step daily increase. A two-sided p-value below 0.05 was considered statistically significant.

Ethical Considerations: The study was conducted after obtaining approval from the Institutional Ethics Committee. Written informed consent was obtained from all participants or their legally authorized representatives before enrolment. Participation was voluntary, and refusal or withdrawal did not affect the clinical care provided. Each participant was assigned a unique study identification number, and directly identifying information was excluded from the analytical dataset. Study records were stored securely in password-protected files and were accessible only to authorized members of the research team. All study procedures were conducted in accordance with accepted ethical principles for research involving human participants.

RESULTS

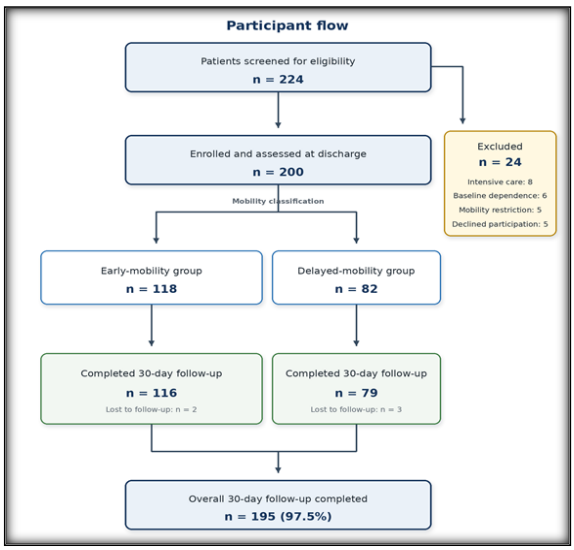

Figure 1: Participant flow through the prospective observational cohort study.

Five participants were unavailable for 30-day follow-up.

Participant flow: During the study period, 224 patients were screened for eligibility. Twenty-four were excluded: eight required intensive care, six were dependent for mobility before admission, five had medical restrictions preventing mobilization and five declined participation. A total of 200 participants were enrolled and completed the discharge assessment. Early mobility was achieved by 118 participants, while 82 had delayed mobility. Thirty-day follow-up was completed for 195 participants, giving a follow-up rate of 97.5%. Participant flow is presented in [Figure 1].

Baseline characteristics: The mean age of the participants was 72.4 ± 4.3 years, and 89 (44.5%) were women. Participants with delayed mobility were older and had a higher comorbidity burden, lower pre-admission Barthel Index, greater frequency of cognitive impairment, greater oxygen requirement, lower serum albumin and more delirium. Baseline characteristics are presented in [Table 1].

Table 1: Baseline demographic and clinical characteristics

Variable	Overall (N=200)	Early mobility (n=118)	Delayed mobility (n=82)	p-value
Age, years	72.4 ± 4.3	71.8 ± 4.1	73.2 ± 4.4	0.024
Female sex	89 (44.5%)	50 (42.4%)	39 (47.6%)	0.469
BMI, kg/m²	23.6 ± 3.8	23.9 ± 3.7	23.2 ± 3.9	0.198
Living with family	171 (85.5%)	104 (88.1%)	67 (81.7%)	0.207
Charlson Comorbidity Index	3 (2–4)	2 (1–4)	3 (2–5)	0.018
Cognitive impairment	52 (26.0%)	24 (20.3%)	28 (34.1%)	0.029
Pre-admission Barthel Index	90 (80–100)	95 (85–100)	85 (75–95)	<0.001
Independent pre-admission mobility	154 (77.0%)	99 (83.9%)	55 (67.1%)	0.005
Emergency admission	178 (89.0%)	103 (87.3%)	75 (91.5%)	0.348
Haemoglobin, g/dL	11.4 ± 1.8	11.6 ± 1.7	11.1 ± 1.9	0.052
Serum creatinine, mg/dL	1.2 (0.9–1.6)	1.1 (0.9–1.5)	1.3 (1.0–1.8)	0.061
Serum sodium, mmol/L	136.8 ± 4.9	137.3 ± 4.5	136.1 ± 5.3	0.085
Serum albumin, g/dL	3.4 ± 0.6	3.6 ± 0.5	3.2 ± 0.6	<0.001
Oxygen requirement	72 (36.0%)	31 (26.3%)	41 (50.0%)	0.001
Delirium	30 (15.0%)	10 (8.5%)	20 (24.4%)	0.002
Polypharmacy	139 (69.5%)	77 (65.3%)	62 (75.6%)	0.119

Values are presented as mean ± standard deviation, median (interquartile range), or number (percentage). BMI: body mass index.

In-hospital mobility: The median time to sitting out of bed was 14 hours, while the median times to standing and walking were 24 and 42 hours, respectively. Participants in the early-mobility group achieved all mobility milestones significantly sooner and recorded a higher median daily step count than those with delayed mobility. Mobility measurements are shown in [Table 2].

Table 2: In-hospital mobility and functional measurements

Variable	Overall	Early mobility	Delayed mobility	p-value
Time to sitting, hours	14 (8–27)	10 (6–16)	31 (24–47)	<0.001
Time to standing, hours	24 (16–45)	18 (12–24)	44 (30–66)	<0.001
Time to walking, hours	42 (28–72)	30 (24–38)	72 (55–101)	<0.001
Daily step count	890 (420–1,520)	1,320 (820–1,930)	460 (190–870)	<0.001
Discharge Barthel Index	85 (70–95)	90 (80–100)	75 (60–90)	<0.001
Barthel Index change	−10 (−20 to 0)	−5 (−10 to 0)	−15 (−25 to −5)	<0.001

Values are presented as median (interquartile range). Barthel Index change was calculated as the discharge score minus the pre-admission score.

Median daily step count increased during hospitalization in both groups but remained consistently higher among participants achieving early mobility, as shown in [Figure 2].

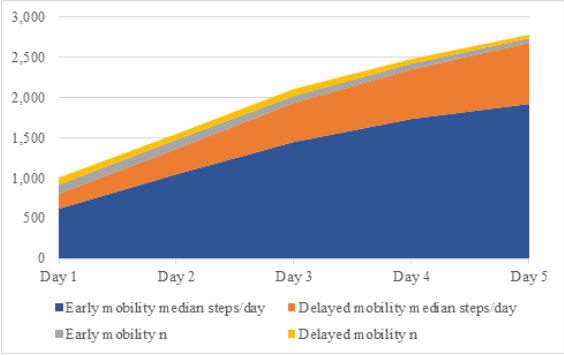

Figure 2: Median daily step count during the first five hospital days according to mobility group.

The number of participants contributing data decreased on successive days because of hospital discharge.

Primary outcome: Functional decline at discharge occurred in 58 of 200 participants (29.0%). The frequency was significantly lower in the early-mobility group than in the delayed-mobility group: 24 of 118 participants (20.3%) compared with 34 of 82 (41.5%; p=0.001). The unadjusted odds ratio for functional decline associated with early mobility was 0.36 (95% confidence interval 0.19–0.68).

Secondary outcomes: Participants achieving early mobility had a shorter median hospital stay than those with delayed mobility: 5 days compared with 8 days. Discharge to the usual home was more frequent in the early-mobility group. Thirty-day readmission and mortality were numerically lower with early mobility, although these differences were not statistically significant. Among participants alive at 30 days, independent mobility was significantly more frequent in the early-mobility group. Hospital and follow-up outcomes are presented in [Table 3].

Table 3: Hospital and 30-day outcomes according to mobility group

Outcome	Early mobility	Delayed mobility	Effect estimate	p-value
Functional decline at discharge	24/118 (20.3%)	34/82 (41.5%)	OR 0.36 (0.19–0.68)	0.001
Length of stay, days	5 (4–7)	8 (6–11)	—	<0.001
Discharge to usual home	105/118 (89.0%)	56/82 (68.3%)	OR 3.75 (1.77–7.94)	<0.001
Discharge to another centre	13/118 (11.0%)	26/82 (31.7%)	OR 0.27 (0.13–0.57)	<0.001
Thirty-day readmission	10/116 (8.6%)	14/79 (17.7%)	OR 0.44 (0.18–1.04)	0.059
Thirty-day mortality	2/116 (1.7%)	4/79 (5.1%)	OR 0.33 (0.06–1.83)	0.220
Independent mobility at 30 days	100/114 (87.7%)	55/75 (73.3%)	OR 2.60 (1.20–5.64)	0.014

Values are number/denominator (percentage) or median (interquartile range). OR: odds ratio. Independent mobility was evaluated among participants alive at 30 days.

Multivariable analysis: After adjustment for age, sex, pre-admission Barthel Index, pre-admission mobility, comorbidity burden, cognitive impairment, admission diagnosis, admission type, oxygen requirement, serum albumin, delirium and contraindications to mobilization, early mobility remained independently associated with lower odds of functional decline.

Each 24-hour delay in walking was associated with a 38% increase in the adjusted odds of functional decline. Each additional 500 steps per day was associated with a 19% reduction in the adjusted odds of functional decline. Early mobility was also independently associated with shorter hospitalization, a greater likelihood of discharge home and independent mobility at 30 days. Multivariable results are presented in [Table 4].

Table 4: Unadjusted and adjusted associations between mobility and outcomes

Exposure and outcome	Unadjusted estimate	Adjusted estimate	p-value
Early mobility and functional decline	OR 0.36 (0.19–0.68)	aOR 0.43 (0.22–0.84)	0.013
Walking delay per 24 hours and functional decline	OR 1.51 (1.25–1.82)	aOR 1.38 (1.12–1.69)	0.002
Additional 500 steps/day and functional decline	OR 0.75 (0.66–0.86)	aOR 0.81 (0.70–0.94)	0.006
Early mobility and length of stay	IRR 0.67 (0.58–0.78)	aIRR 0.72 (0.62–0.84)	<0.001
Early mobility and home discharge	OR 3.75 (1.77–7.94)	aOR 2.79 (1.28–6.10)	0.010
Early mobility and 30-day readmission	OR 0.44 (0.18–1.04)	aOR 0.52 (0.21–1.29)	0.159
Early mobility and independent mobility at 30 days	OR 2.60 (1.20–5.64)	aOR 2.19 (1.02–4.69)	0.044

aIRR: adjusted incidence-rate ratio; aOR: adjusted odds ratio; IRR: incidence-rate ratio; OR: odds ratio. Adjusted models included the prespecified demographic, functional and clinical covariates.

DISCUSSION

The present prospective observational cohort study examined the relationship between early in-hospital mobility and functional decline among adults aged 65–80 years admitted with acute medical illness. The principal finding was that participants who sat out of bed within 24 hours and walked within 48 hours experienced less functional decline at discharge than those with delayed mobility. Functional decline occurred in 20.3% of participants with early mobility compared with 41.5% of those with delayed mobility. After adjustment for demographic characteristics, pre-admission function, comorbidity burden, cognitive impairment, admission-related factors, oxygen requirement, serum albumin and delirium, early mobility remained independently associated with lower odds of functional decline. These findings are consistent with previous studies reporting associations between restricted in-hospital mobility, loss of independence and adverse functional outcomes among hospitalized older adults.[1–4,6]

A dose-related association was also observed. Each 24-hour delay in walking was associated with a 38% increase in the adjusted odds of functional decline, whereas each additional 500 steps per day was associated with a 19% reduction. These findings suggest that both the timing and amount of mobility may be clinically relevant. Previous studies using activity monitors have demonstrated that hospitalized older adults undertake very little ambulatory activity and that lower step counts are associated with poorer hospitalization-related outcomes.[6–8] Assessment based only on whether a patient walked at any point during hospitalization may therefore fail to identify important differences

in the duration of bed rest and overall ambulatory activity.

The association between mobility and functional outcomes is biologically plausible. Acute illness can result in fatigue, reduced oral intake, systemic inflammation and decreased physical activity. Prolonged bed rest may further contribute to loss of muscle mass, reduced strength, impaired balance, decreased aerobic capacity and orthostatic intolerance.[2,5] Older adults are particularly vulnerable because they frequently have reduced physiological reserve, multiple comorbidities, sarcopenia and pre-existing functional limitations. Early sitting, standing and walking may help maintain muscle activation, postural control and the ability to perform everyday activities.

Participants in the early-mobility group also had a shorter median hospital stay. Their median stay was five days, compared with eight days among those with delayed mobility. This finding is consistent with previous research demonstrating an association between early ambulation and shorter hospitalization among older adults admitted with acute illness.[10] Earlier mobility may support recovery by improving physical capacity and enabling patients to meet functional discharge criteria sooner. However, this relationship may operate in both directions. Patients with less severe illness may mobilize earlier and may also be discharged sooner. Although the analysis adjusted for several indicators of illness severity, residual confounding cannot be excluded.

Discharge to the usual home was more frequent among participants achieving early mobility. Nearly nine out of ten participants in the early-mobility group returned home, compared with approximately two-thirds of those with delayed mobility. The ability to transfer, stand and walk safely is an important consideration when determining discharge destination. Loss of independence during hospitalization has previously been associated with increased care requirements and poorer post-discharge outcomes.[1,4] Patients with persistent mobility limitations may require rehabilitation, greater caregiver support or transfer to another healthcare centre. Early identification of delayed mobility could therefore help the clinical team initiate physiotherapy, caregiver training and discharge planning at an earlier stage.

The beneficial association appeared to extend beyond hospital discharge. Independent mobility at 30 days was present in 87.7% of survivors in the early-mobility group and 73.3% in the delayed-mobility group. Previous research has demonstrated that restricted mobility during hospitalization may contribute to functional decline that persists after discharge.[4] Maintaining walking ability is particularly important because it influences the capacity to perform self-care, access essential services and participate in community and family activities.

Thirty-day readmission and mortality were numerically lower among participants with early mobility, but these differences were not statistically significant after adjustment. These outcomes were relatively uncommon, and the study may not have had sufficient statistical power to detect modest differences. Readmission and mortality are also influenced by factors that may not be directly related to hospital mobility, including disease severity, treatment response, social support, medication adherence and access to follow-up care. The absence of statistical significance should therefore not be interpreted as evidence that mobility has no relationship with these outcomes.

The baseline differences between the mobility groups require careful consideration. Participants with delayed mobility were older and had greater comorbidity, lower pre-admission Barthel Index scores, more cognitive impairment, greater oxygen requirements, lower serum albumin concentrations and a higher frequency of delirium. These characteristics could independently increase the risk of functional decline while reducing the likelihood of early walking. Patient-related clinical factors have previously been shown to influence physical activity during acute hospitalization.[9] Multivariable adjustment reduced this potential confounding; however, statistical adjustment cannot account for unmeasured factors or completely eliminate confounding by indication. The results should consequently be interpreted as associations rather than proof that early mobility directly prevented functional decline.

The study has several strengths. Participants were enrolled prospectively using consecutive sampling, reducing the likelihood of selective inclusion. Mobility was assessed using both milestone timing and daily step count, providing information regarding the timing and dose of activity. Pre-admission, discharge and 30-day functional status were evaluated using the Barthel Index, a standardized measure of independence in activities of daily living.[12] Delirium was screened using the validated 4AT instrument,[13] and comorbidity burden was quantified using the Charlson Comorbidity Index.[14] The reporting of the study was guided by the STROBE recommendations for observational research.[15] The study also evaluated clinically meaningful outcomes, including length of stay, discharge destination, readmission, mortality and independent mobility at 30 days.

Several limitations should be acknowledged. First, the observational design prevents causal conclusions. Second, the study was conducted at a single centre, which may limit generalizability to hospitals with different patient populations, ward environments, staffing levels or mobility practices. Third, patients older than 80 years and those who were completely dependent before admission were excluded, limiting applicability to more vulnerable groups. Fourth, the pre-admission Barthel Index was based partly on patient or caregiver recall and may

have been affected by recall bias. Fifth, step-count measurements could have been influenced by device accuracy, slow gait, inconsistent wear time and interruptions caused by medical procedures. Sixth, the fixed thresholds used to define early mobility may not be appropriate for every diagnosis or clinical condition. Finally, the sample size limited the precision of estimates for relatively uncommon outcomes such as readmission and mortality.

Despite these limitations, the findings have potential clinical implications. Mobility assessment could be incorporated into routine care using simple milestones such as time to sitting, standing and walking. Daily step count may provide an additional objective measure where suitable monitoring devices are available. Evidence from clinical trials suggests that individualized exercise and mobility interventions can help preserve functional ability during acute hospitalization among older adults.[11] Patients who fail to achieve early mobility could undergo prompt assessment for reversible barriers, including pain, delirium, excessive sedation, unnecessary catheters, fear of falling, inadequate assistance and absence of appropriate footwear. Mobility plans should nevertheless remain individualized and should account for haemodynamic stability, oxygen requirements, disease severity and other clinical contraindications.

In conclusion, early in-hospital mobility was independently associated with less functional decline, shorter hospitalization, a greater likelihood of discharge home and better independent mobility at 30 days among older adults admitted with acute medical illness. Delayed walking and lower daily step counts were associated with poorer functional outcomes. These findings support systematic mobility assessment during hospitalization while emphasizing that mobilization must be clinically appropriate and individualized. Larger multicentre studies and intervention trials are required to determine whether structured early-mobility programmes can directly improve functional recovery and other patient-centred outcomes.

Limitations: This single-centre observational study cannot establish a causal relationship between early mobility and functional outcomes. Residual confounding by illness severity, frailty and clinical stability may remain despite statistical adjustment. Pre-admission Barthel Index was based partly on patient or caregiver recall, introducing potential recall bias. Step-count accuracy may have been influenced by slow gait and variations in device wear time. The sample size may have been insufficient to detect differences in uncommon outcomes such as readmission and mortality.

CONCLUSION

Early in-hospital mobility was independently associated with a lower frequency of functional decline, shorter hospital stay, a greater likelihood of discharge home and better independent mobility at 30 days among older adults admitted with acute medical illness. Delayed walking and lower daily step counts were associated with poorer functional outcomes. Routine assessment of mobility milestones and timely, clinically appropriate mobilization may help preserve functional independence during hospitalization. Larger multicentre studies and intervention trials are required to confirm these findings and determine whether structured early-mobility programmes directly improve patient outcomes.

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