RESEARCH PAPER

Geriatric evaluation and management inpatients spend little time participating in physically, cognitively or socially meaningful activity: a time–motion analysis

LAURA JOLLIFFE[1,2,3], TAYA A COLLYER[2,3], KA HEI SUN[2], LISA DONE[2], SIOBHAN BARBER[2],
MICHELE L. CALLISAYA[3,4], DAVID A SNOWDON[4,5]

[1]Department of Occupational Therapy, School of Primary and Allied Health Care, Monash University, Peninsula Campus, 47-49
Moorooduc Highway, Frankston, Victoria, 3199, Australia
[2]Peninsula Health, 2 Hastings Road, Frankston, Victoria, 3199, Australia
[3]National Centre for Healthy Ageing, Ngarnga Centre, 2 Hastings Road, Frankston, Victoria, 3199, Australia
[4]Peninsula Clinical School, School of Translational Medicine, Monash University, 2 Hastings Road, Frankston, Victoria, 3199, Australia
[5]La Trobe University, College of Science Health and Engineering, Plenty Road, Bundoora, Victoria, 3086, Australia

Address correspondence to: Laura Jolliffe, Department of Occupational Therapy, School of Primary and Allied Health Care,
Monash University, Peninsula Campus, 47-49 Moorooduc Highway, Frankston, Victoria, 3199, Australia.
Email: laura.jolliffe@monash.edu

Abstract

Background: Geriatric Evaluation and Management (GEM) services provide subacute care for older adults with complex conditions. Meaningful activities are important for preventing functional decline in hospitalised older adults; however, no studies have evaluated GEM inpatients' participation in such activities.
Objective: To determine the proportion of time GEM inpatients spend performing meaningful activities during the day and investigate whether ward environments and day of the week are associated with activity levels.
Method: This observational study used behavioural mapping to audit inpatients across three GEM wards. Observations were made at 10-minute intervals over 12 consecutive hours on weekdays and 10.5 hours on weekend days. Activities were categorised as physical, cognitive or social. Logistic mixed models were used to analyse factors associated with engagement in meaningful activities.
Results: In total, 60 030 minutes were observed among 70 inpatients. Overall, GEM inpatients spent 16%, 6% and 18% of observed time in physically, cognitively and socially meaningful activities, respectively. Weekend days were associated with higher odds of cognitive engagement (OR 4.79, 95% CI 1.71–13.41, $P = .003$) but lower odds of social engagement (OR 0.57, 95% CI 0.38–0.85, $P = .006$). Time spent outside patients' rooms was positively associated with all types of meaningful activities. The odds of physically meaningful activity were not found to vary between weekends and weekdays.
Conclusions: GEM inpatients demonstrate lower engagement in meaningful activities compared to rehabilitation contexts. The positive association between activity levels and time spent outside patients' rooms emphasises the importance of accessible communal areas. Interventions to promote active participation are needed in inpatient GEM settings.

Keywords: inpatients; time and motion studies; older adults; physical activity; social participation; older people

Key Points

- This study provides the first comprehensive analysis of meaningful activity patterns among Geriatric Evaluation and Management inpatients, revealing significantly lower levels of meaningful activity compared to rehabilitation settings.
- Findings highlight the importance of communal spaces in promoting physical, cognitive and social activities.

- Given the increasing pressures on hospitals to optimise space utilisation, these results emphasise the need to balance efficient use of resources with environments that facilitate patient engagement.

Introduction

Geriatric Evaluation and Management (GEM) provides sub-acute care for people with complex conditions associated with ageing [1, 2]. GEM aims to improve the functioning of a person with multidimensional needs [2] through a coordinated multidisciplinary approach [1]. In the inpatient setting, trials conducted across six countries have found that GEM reduces the risk of functional decline at discharge and reduces the risk of discharge to a residential aged care facility [1, 3]. As such, GEM services are thought to play a significant role in meeting the demand for healthcare services from an ageing population with increasing complexity of healthcare needs [4].

It is important that people receiving GEM inpatient services are engaged in meaningful activities to ensure that they do not functionally decline [5–7]. Meaningful activities include any purposeful physical movements (i.e. physical activity), verbal or nonverbal interaction with others (i.e. social activity), or engagement in nonphysical mental tasks (i.e. cognitive activity) [8–10]. These activities can be completed by inpatients as a part of the therapy they receive in GEM or outside of this therapy. Additionally, there is well-established evidence between participation in meaningful activities and the minimisation of hospital-acquired harms such as delirium, falls and pressure injuries [11]. Despite the established benefits of engaging meaningfully, participation in such activities declines with age, disability and admission to the hospital, which further highlights the importance of people receiving GEM services engaging meaningfully within an inpatient context [12, 13]. However, to date, there has been no evaluation of GEM inpatients' participation in meaningful activities.

Research on meaningful activities has predominantly focused on inpatient rehabilitation settings. These studies have found that inpatients spend up to 27% of their time inactive [10, 14, 15], approximately half of their time performing physical activities and large variations in time spent performing cognitive (28% to 65%) and social (42%–66%) activities [8, 9, 15]. Further, prior work suggests ward environments and day of the week (i.e. weekday vs. weekend) influence inpatients' participation in meaningful activities [9, 15, 16]. These results are not necessarily generalisable to inpatient GEM populations. GEM units differ from a general rehabilitation unit mode of service due to increased complexity of medical needs of the patients [17]; GEM units have a greater focus on geriatric medical input and longer-term care planning, compared to rehabilitation where the focus is on maximising independence for return to home [2, 18]. As such, GEM units typically have less staff than rehabilitation units, which may influence participation in meaningful activities [9].

The proposed study aims to understand the activity patterns of inpatients in three GEM wards. The findings are expected to provide a robust foundation for designing evidence-based strategies to promote active and engaged participation among older adults in GEM settings, ultimately contributing to improved health outcomes and enhanced quality of life.

The research questions were:

1. What proportion of time do GEM inpatients spend performing meaningful activities during the day?
2. Are ward environments and day of the week (i.e. weekday vs. weekend) associated with the proportion of time GEM inpatients spend performing meaningful activities?

Method

Design

This prospective observational study was conducted using behavioural mapping techniques [19, 20]. Data were collected between September and November 2022. Given the observational nature of the study, a waiver of patient consent was sought, and the study received institutional ethics approval from the Peninsula Health Human Research Ethics Committee prior to commencement (HREC/87339/PH-2022).

Setting and participants

This study was conducted at a 90-bed GEM hospital. Patients are typically over the age of 65 years, admitted following an acute care admission and have a range of diagnoses including falls and related injuries, dementia and/or delirium, stroke, functional decline or infection.

The GEM hospital consists of three wards; two wards are designated as general wards, and one is a specialised ward. While the general wards share identical layouts and accessibility, the specialised ward is specifically designed to accommodate inpatients with cognitive impairments or behaviours of concern (BOCs) and has locked access points to ensure a secure environment for those at risk of wandering or absconding. Staff working on wards included the treating team (nursing, medical, allied health and healthcare assistants) and support staff (cleaners, kitchen staff, administration). Refer to Appendix 1a of the Supplementary Data section for the description of ward layout and staffing profiles.

All inpatients on the participating wards were considered for inclusion. Those being actively palliated were excluded, along with patients with planned discharge/transfer to another ward prior to data collection. A random sample of 15 inpatients was drawn using a computer random number

generator on the morning of the audits, from each of the three 30-bed wards.

Procedure

Behaviour mapping [19, 20] was used to observe patient participation in meaningful activities. This approach allows for diverse activity types to be identified and captures patients' social interactions that are often missed using other study designs, such as accelerometry [21]. Behaviour mapping also provides important contextual information for the activities observed (e.g. location).

Meaningful activity included any purposeful physical movements (i.e. physical activity), verbal or nonverbal interaction with others (i.e. social activity) or engagement in nonphysical mental tasks (i.e. cognitive activity) [8–10]. Inactivity was, therefore, defined as the absence of any of these activities. This method of data collection required categorisation of activities as physical, social or cognitive engagement, without dual-task recording [20].

To obtain an estimate of patient activity, behaviour was audited at 10-minute intervals over 12 consecutive hours of a weekday (Monday—Friday) and 10.5 consecutive hours of a weekend day (Saturday or Sunday) between 7:00 and 17:30. Observers (i.e. data collectors) were unknown to participants, and two observers were allocated to each ward. The observer moved through each location in a pre-determined circuit, commencing a new circuit every 10 minutes. Observations on each patient were made for 15 seconds. At each observation timepoint, the category of activity (i.e. physical, cognitive, social), location, people present, clothing, footwear and equipment (i.e. aids and leisure) was recorded. To respect patient privacy, patients were not followed off-site nor intruded on if behind closed curtains or in the bathroom. Two observers were used, per ward, for all observation periods, and a third observer was used for relief periods (i.e. lunch breaks). In total, nine auditors (healthcare professionals $n = 6$; clinical researchers $n = 3$) recorded observations. Auditors received training in the auditing approach by the lead researcher to ensure accuracy. In instances where direct observations were unable to be made (e.g. while a participant was in the bathroom), activity was recorded after confirming with attending clinical staff. Where this was unable to be confirmed, time was classified as unobserved.

Outcome measures

Time spent in activity was recorded using a purpose-designed audit form, adapted from previously published work [22–24]. The category domains can be found in Appendix 1b of the Supplementary Data section.

The audit record sheet listed options under each of the respective domains, and data were recorded as binary (yes/no). The day of audit was also recorded (i.e. weekend vs. weekday). Activity data from the recorded observations were classified as either meaningful or nonmeaningful engagement.

Participant demographics were collected to describe the cohort, including: sex, age, admission functional independence measure (FIM) score, time from admission to observation, ward (i.e. general or specialised), and reason for admission. FIM is routinely administered on the wards, and therefore, consistent with previous evaluations of GEM units was used as a measure of function and cognition [17, 25].

Data analysis

Average time spent on tasks per day (minutes/observed time) and proportion of time spent on task categories (%) were used to describe the data. Participant characteristics were described using proportion (%) and mean (SD).

To investigate the extent to which individual factors (sex, age, presenting diagnosis, comorbidities, admission FIM score, presence of cognitive impairment, admitted ward, location, day of week and company present) were associated with engagement in meaningful activity, logistic mixed models were fit at the timepoint level to compare the odds of patients engaging (or not) in meaningful activity. Standard logistic regression modelling was inappropriate for these data due to the strong correlation across timepoints and days for individual patients [26]. Integration (estimation of log-likelihood) was achieved via mean–variance adaptive Gauss–Hermite quadrature. All analyses were completed using STATA Version 16.0 [27].

To minimise missing data regarding 'people present' and mitigate potential bias in subsequent analyses, informed imputations based on assumptions were made for unobserved time points. These assumptions were derived from predictable patterns of patient location and established routines in GEM settings and were determined through discussion and consensus by two experienced clinician researchers from the team. The imputations are provided in Appendix 1c of the Supplementary Data section.

Results

In total, 71 inpatients were observed. However, one participant was excluded after data collection, as their care pathway had changed during the auditing period to active palliation. Therefore, data from a total of 70 inpatients were included in data analyses. Nineteen (27%) were observed on both a weekday and weekend day, 25 (35%) were observed on only a single weekday and 26 (37%) were observed on only a single weekend day; meaning that there were 89 days of observation (44 on a weekday, 45 on a weekend day). Participant characteristics are provided in Table 1.

Observations were made for a total of 60 030 minutes. Inpatients spent 85% of their time in their own room and <1% in therapy spaces (i.e. gym, therapy room). Inpatients were alone for 66% of their time, spending 13% with the treating team and 3% with support staff. Fifty percent of their time was spent in pyjamas and 35% in day clothes. Further details on location, people present, clothing, footwear

Table 1. Participant characteristics

Total patients admitted	Overall (n = 70)
Sex, n (%)	
Male	24 (34)
Female	46 (66)
Age group, mean (SD)	81 (11)
Admission FIM score, mean (SD)	
Motor	35.9 (13.5)
Cognitive	19.3 (8.2)
Total	55.2 (17.8)
Time from admission to observation, mean (SD)	34.5 (48.2)
Ward	
General wards	45 (64)
Specialised ward	25 (36)
Day of observation, n (%)	
Weekday only	25 (36)
Weekend only	26 (37)
Both weekday and weekend	19 (27)
Primary reason for admission, n (%)	
Fall	20 (29)
Functional decline	12 (17)
Fracture	11 (16)
Stroke	5 (7)
Cognition[a]	10 (14)
Pain	4 (6)
Infection	1 (1)
Other medical conditions	7 (10)

[a]Cognition affecting ability to cope with living at home.

and equipment are provided in Appendix Table 1 of the Supplementary Data section.

Meaningful activity

Missing data

Physical activity could not be observed/confirmed for 5190 minutes (9%); cognitive activity for 4770 minutes (8%); and social activity for 5330 minutes (9%).

Physical activity

Inpatients spent 16% (8780/54 840 minutes) of observed time participating in meaningful physical activity. The most-performed meaningful physical activity was self-care (4%) (Table 2). Inpatients spent <1% of observed time walking. Time spent in meaningful physical activity is detailed in Appendix Table 2 of the Supplementary Data section.

Regression analysis showed that neither ward nor day of the week was associated with time spent performing meaningful physical activity (Table 3). Time spent in the ward space (OR 1.48, 95% CI 1.07–2.05, P = .019), bathroom (OR 148.96, 95% CI 64.45–344.24, P < .001) or other locations (i.e. gym, offsite, outside and therapy room; OR 4.35, 95% CI 2.57–7.37, P < .001) had higher odds of being physically meaningful than time spent in the patient's room. Time spent with the treating team (OR 2.67, 95% CI 2.18–3.27, P < .001) or with visitors (OR 1.75, 95% CI 1.21–2.53) had higher odds of being physically meaningful than time spent alone.

Cognitive activity

Inpatients spent 6% (3100/55 260 minutes) of observed time participating in meaningful cognitive activity. The most performed meaningful cognitive activities were reading (2%) and listening to music (2%). Time spent in meaningful cognitive activity is detailed in Appendix Table 3 of the Supplementary Data section.

Regression analysis showed that time spent on weekend days had higher odds of being cognitively meaningful than time spent on weekdays (OR 4.79, 95% CI 1.71–13.41, P = .003) (Table 4). Time spent by patients with cognitive impairment had higher odds of being cognitively meaningful than time spent by patients with an admission diagnosis of a fall (OR 8.15, 95% CI 1.11–59.82, P = .039). Location (ward space: OR 2.46, 95% CI 1.48–4.10, P = .001) was also positively associated with time spent performing meaningful activity. Time spent with visitors had lower odds of being cognitively meaningful than time spent alone (OR 0.28, 95% CI 0.08–0.92, P = .037).

Social activity

Inpatients spent 18% (9770/54 700 minutes) of observed time participating in meaningful social activity. The most performed meaningful social activities were talking (2%) and passive social interaction (3%). Inpatients spent 26% of observed time sleeping. Time spent in meaningful social activity is detailed in Appendix Table 4 of the Supplementary Data section.

Regression analysis showed that time spent on weekend days had lower odds of being socially meaningful than time spent on weekdays (OR 0.57, 95% CI 0.38–0.85, P = .006) (Table 5). Time spent outside of the patient's room (ward space: OR 1.62, 95% CI 1.12–2.33, P = .010; other: OR 1.96, 95% CI 1.05–3.66, P = .036) and time spent with company (other patients: OR 21.40, 95% CI 14.76–31.05, P < .001; treating team/support staff: OR 24.69, 95% CI 19.27–31.63, P < .001; visitors: OR 270.75, 95% CI 170.66–429.55, P < .001) were both positively associated with meaningful social activity.

Discussion

This is the first behaviour mapping study conducted in a subacute GEM setting to explore how hospitalised older adults spend their time and factors associated with participation in meaningful activity. We found that inpatients spent 16%, 6% and 18% of daytime engaged in physically, cognitively and socially meaningful activities, respectively. Results from regression analyses show that weekend day increased the odds of time spent engaged in cognitively meaningful activity; however, decreased the odds of time spent in socially meaningful activity. No differences were found between days of the week for the time spent in physically meaningful activity.

Table 2. Time observed for physical, cognitive and social activity

Item	Overall	Day of week		Ward	
		Weekday	Weekend	1 & 2	3
	n = 89	n = 44	n = 45	n = 59	n = 30
Total observed time, min	60 030	31 680	28 350	39 780	20 250
Activity: physical, min (%)					
IADL activity	10 (<1%)	0 (<1%)	10 (<1%)	10 (<1%)	0
Lying	18 790 (31%)	9450 (30%)	9340 (33%)	12 190 (31%)	6600 (33%)
Self-care	2220 (4%)	1500 (5%)	720 (3%)	1450 (4%)	770 (4%)
Sitting	31 670 (53%)	17 130 (54%)	14 540 (51%)	21 170 (53%)	10 500 (52%)
Standing	340 (<1%)	170 (<1%)	170 (<1%)	200 (<1%)	140 (<1%)
Therapy	470 (<1%)	440 (1%)	30 (<1%)	340 (<1%)	130 (<1%)
Transferring	330 (<1%)	210 (<1%)	120 (<1%)	240 (<1%)	90 (<1%)
Walking	560 (<1%)	300 (<1%)	260 (<1%)	210 (<1%)	350 (2%)
Wandering	450 (<1%)	340 (1%)	110 (<1%)	120 (<1%)	330 (2%)
Unobserved	5190 (9%)	2140 (7%)	3050 (11%)	3850 (10%)	1340 (7%)
Activity: cognitive, min (%)					
No cognitive activity	52 160 (87%)	28 260 (89%)	23 900 (84%)	34 310 (86%)	17 850 (88%)
Cognitive therapy	100 (<1%)	100 (<1%)	0	40 (<1%)	60 (<1%)
Computer/tablet	530 (<1%)	190 (<1%)	340 (1%)	310 (<1%)	220 (1%)
Music	1060 (2%)	410 (1%)	650 (2%)	130 (<1%)	930 (5%)
Puzzles/games	310 (<1%)	130 (<1%)	180 (<1%)	220 (<1%)	90 (<1%)
Reading	1030 (2%)	500 (2%)	530 (2%)	940 (2%)	90 (<1%)
Writing/art	70 (<1%)	40 (<1%)	30 (<1%)	70 (<1%)	0
Unobserved	4770 (8%)	2050 (6%)	2720 (10%)	3760 (9%)	1010 (5%)
Activity: social, min (%)					
Socially inactive	29 250 (49%)	15 750 (50%)	13 500 (48%)	20 210 (51%)	9040 (45%)
Being in a group	40 (<1%)	0	40 (<1%)	0	40 (<1%)
Kissing	10 (<1%)	10 (<1%)	0	0	10 (<1%)
Laughing	290 (<1%)	120 (<1%)	170 (<1%)	120 (<1%)	170 (<1%)
Passive social interaction	1910 (3%)	1430 (5%)	480 (2%)	800 (2%)	1110 (5%)
Phone call	300 (<1%)	260 (<1%)	40 (<1%)	290 (<1%)	10 (<1%)
Sleeping	15 680 (26%)	7630 (24%)	8050 (28%)	10 080 (25%)	5600 (28%)
Talking	6840 (11%)	3910 (12%)	2930 (10%)	3970 (10%)	2870 (14%)
Touch/holding hands	40 (<1%)	0	40 (<1%)	20 (<1%)	20 (<1%)
Use of phone/email	340 (<1%)	210 (<1%)	130 (<1%)	230 (<1%)	110 (<1%)
Unobserved	5330 (9%)	2360 (7%)	2970 (10%)	4060 (10%)	1270 (6%)

IADL, Instrumental Activity of Daily Living.

Findings from our study demonstrate a distinct pattern of GEM inpatient behaviour, with lower levels of engagement observed across physical, cognitive and social activities compared to inpatient rehabilitation contexts [8–10, 14, 15] Previous studies have indicated that inpatients of rehabilitation might spend between 28% and 65% of their time in cognitive activities and 42%–66% in social activities [8, 9, 15]. In contrast, GEM inpatients in our study engaged in cognitive and social activities well below these ranges. Similarly, while physical activities have been shown to occupy approximately half the day in inpatient rehabilitation contexts [8, 9, 15], in the GEM context, only 16% of time was spent in physical activity. Some observed discrepancies in activity levels between our study and rehabilitation contexts can be reasonably explained by differences in resourcing (e.g. staffing profiles) and complexity of care needs; however, the extent of this activity difference is concerning. The notably low engagement rates in the GEM context are of particular concern, given the well-documented risks of hospital-acquired harms that disproportionately affect hospitalised older adults [28, 29]. The findings of our study possibly highlight underutilisation of therapeutic interventions and/or strategies that facilitate engagement in meaningful activities and are known to mitigate these risks [30, 31].

Consistent with a previous evaluation in a rehabilitation context, GEM inpatients were less likely to spend time on social activities [16] during the weekend. Socialisation is dependent on the availability of staff and visitors, which is lower on weekends [16]. While it is unclear why visitors are less available on weekends, staffing is more expensive on weekends and their unavailability reduces opportunities for structured group activities that facilitate social interaction [16]. Encouragingly, increasing GEM weekend staffing levels has been shown to increase provision of therapy and participation in meaningful activity [15, 17, 25]. However, higher staffing levels have had little impact on length of hospital stay and may not be cost effective [17, 25]. Alternative solutions need to be investigated, such as incentivising visitors over the weekend and/or utilising a lower-cost healthcare assistant workforce [32].

Table 3. Factors influencing time spent on physically mean-ingful activities (*n* = 70 cases; 5484 total time points)

Variable	Patient-related tasks 5484 total time points Odds ratio (95% CI)	*P*
Sex		
Male	Reference group	
Female	1.05 (0.79–1.40)	.751
Cognitive impairment		
Absent	Reference group	
Present	0.78 (0.56–1.09)	.150
Age[a]	1.00 (0.99–1.02)	.409
Presenting condition		
Fall	Reference group	
Cognitive impairment	0.91 (0.58–1.42)	.674
Functional decline	0.70 (0.45–1.09)	.114
Medical	1.01 (0.61–1.67)	.956
Fracture	1.02 (0.69–1.51)	.925
Infection	0.69 (0.30–1.61)	.392
Stroke	0.78 (0.44–1.40)	.403
Pain	0.62 (0.31–1.23)	.174
Comorbidities[a]	0.92 (0.83–1.04)	.208
Wards		
General	Reference group	
Specialised	1.14 (0.81–1.61)	.453
Total FIM admission score[a]	1.00 (0.99–1.01)	.713
Location		
Own room	Reference group	
Ward space	1.48 (1.07–2.05)[b]	.019
Bathroom	148. 96 (64.45–344.24)[b]	<.001
Other	4.35 (2.57–7.37)[b]	<.001
Day of week		
Weekday	Reference group	
Weekend	0.81 (0.63–1.05)	.111
Company		
Alone	Reference group	
Other patients	0.75 (0.49–1.13)	.166
Treating team/support staff	2.67 (2.18–3.27)[b]	<.001
Visitors	1.75 (1.21–2.53)[b]	.003

FIM, Functional Independent Measure. Location 'other' includes gym, off-site, outside and therapy room. [a]Continuous variable (no reference group). [b]Statistically significant.

Table 4. Factors influencing time spent on cognitively mean-ingful activities (*n* = 70 cases; 5526 total time points)

Variable	Patient-related tasks 4780 total time points Odds ratio (95% CI)	*P*
Sex		
Male	Reference group	
Female	2.62 (0.64–10.70)	.180
Cognitive impairment		
Absent	Reference group	
Present	1.10 (0.22–5.34)	.907
Age[a]	0.98 (0.91–1.06)	.594
Presenting condition		
Fall	Reference group	
Cognitive impairment	8.15 (1.11–59.82)	.039
Functional decline	1.51 (0.24–9.63)	.664
Medical	1.36 (0.13–14.40)	.800
Fracture	0.33 (0.05–2.34)	.271
Infection	[b]	
Stroke	[b]	
Pain	1.82 (0.09–35.75)	.693
Comorbidities[a]	0.89 (0.51–1.57)	.695
Wards		
General	Reference group	
Specialised	0.68 (0.15–3.20)	.629
Total FIM admission score[a]	0.98 (0.94–1.02)	.391
Location		
Own room	Reference group	
Ward space	2.46 (1.48–4.10)[c]	.001
Bathroom	[b]	
Other	0.72 (0.31–1.68)	.453
Day of week		
Weekday	Reference group	
Weekend	4.79 (1.71–13.41)[c]	.003
Company		
Alone	Reference group	
Other patients	1.46 (0.87–2.45)	.148
Treating team/support staff	1.43 (0.98–2.09)	.061
Visitors	0.28 (0.08–0.92)[c]	.037

FIM, Functional Independent Measure. Location 'other' includes gym, offsite, outside and therapy room. [a]Continuous variable (no reference group). [b]No observed meaningful activity for this variable. [c]Statistically significant.

Conversely, our results suggest that less structured time over the weekend results in greater opportunities for patients to participate in independent cognitive activities. Again, this finding is consistent with previous literature that found that inpatients of rehabilitation were more likely to spend time alone performing cognitive activities, such as reading, over the weekend [16]. This finding might also suggest that therapy on weekdays is not commonly targeted towards engaging inpatients in cognitive activities. Our results suggest that this therapy was likely targeted towards those with cognitive impairments, who were the most likely to spend their time on cognitive activities. Given the benefits of cognitive train-ing for older adults, GEM units might consider how they can provide greater opportunities for inpatients to participate in meaningful cognitive activity [33].

The strongest predictor of engagement in any mean-ingful activity—whether physical, cognitive or social—was the patient being outside of their own room. This finding emphasises the critical role of communal and gym spaces in promoting patient activity. Our results align with recent research in rehabilitation settings, which demonstrated that patients spent a greater proportion of time being physically and socially active in communal spaces compared to bed-rooms [8]. These findings are further supported by studies showing that communal areas can increase cognitive stimu-lation [34, 35]. Well-resourced communal areas for eating, socialising and completing group activities contribute to increased patient activity levels throughout the day [15, 36]. Our findings on the influence of communal spaces suggest that the application of 'whole day rehabilitation' principles as proposed by Kelso and colleagues [8] is a potentially relevant strategy for GEM settings. This approach could significantly enhance meaningful engagement in activities through enriched communal environments, extending the

Table 5. Factors influencing time spent on socially meaningful activities (n = 70 cases; 5470 total time points)

Variable	Patient-related tasks 5470 total time points Odds ratio (95% CI)	P
Sex		
Male	Reference group	
Female	1.63 (0.92–2.89)	.095
Cognitive impairment		
Absent	Reference group	
Present	0.72 (0.37–1.40)	.325
Age[a]	0.99 (0.96–1.02)	.489
Presenting condition		
Fall	Reference group	
Cognitive impairment	1.13 (0.47–2.70)	.788
Functional decline	1.36 (0.60–3.06)	.460
Medical	0.58 (0.22–1.54)	.274
Fracture	1.02 (0.46–2.26)	.971
Infection	0.23 (0.04–1.21)	.083
Stroke	0.33 (0.10–1.10)	.072
Pain	1.48 (0.42–5.25)	.541
Comorbidities[a]	0.99 (0.79–1.25)	.959
Wards		
General	Reference group	
Specialised	1.03 (0.53–2.00)	.935
Total FIM admission score[a]	1.00 (0.99–1.02)	.476
Location		
Own room	Reference group	
Ward space	1.62 (1.12–2.33)[b]	.010
Bathroom	0.69 (0.40–1.19)	.183
Other	1.96 (1.05–3.66)[b]	.036
Day of week		
Weekday	Reference group	
Weekend	0.57 (0.38–0.85)[b]	.006
Company		
Alone	Reference group	
Other patients	21.40 (14.76–31.05)[b]	<.001
Treating team/support staff	24.69 (19.27–31.63)[b]	<.001
Visitors	270.75 (170.66–29.55)[b]	<.001

FIM, Functional Independent Measure. Location 'other' includes gym, off-site, outside and therapy room. [a]Continuous variable (no reference group.) [b]Statistically significant.

benefits observed in rehabilitation settings to subacute care for older adults. Our study thus provides some justification for maintaining and prioritising accessible, enriched communal areas, particularly in the face of pressure to repurpose such spaces for additional beds to meet the demand for healthcare services [37].

This study has limitations that must be considered. First, the research was conducted across three wards at a single healthcare organisation. GEM units are heterogeneous in their organisation and practice [3] and also likely vary in culture. This may influence the working practices of staff [38, 39] and thus opportunities for inpatients to participate in meaningful activities. Therefore, the generalisability of our results to broader populations in different healthcare settings is limited. Despite this, we have provided details about our GEM wards (staffing profiles, ward layout, patient characteristics) which allow comparisons to be made to different settings; a feature that should be included in future studies.

Second, to reduce the risk of COVID-19 contamination across wards, inpatients from different wards could not co-occupy the gym. Restricted access to the gym might partly explain low physical activity levels. Thirdly, the FIM may have a ceiling effect in functional status [40] and decreased sensitivity for frail or cognitively impaired cohorts [41] so the nonsignificant association between FIM scores and participation in meaningful activity should be interpreted with caution. Last, the method of data collection required categorisation of activities as either physical, social or cognitive engagement, without dual-task recording [20]. This approach poses a limitation in recording activities that inherently involve both social and cognitive elements. For example, an interaction with a visitor, which may include therapeutic speech practice, was recorded solely as 'social engagement', likely explaining the very low estimated odds of time with visitors as cognitively meaningful. This methodological approach does not fully capture the cognitive demands of such interactions, potentially oversimplifying the multifaceted nature of patient activities.

Conclusion

This study provides the first comprehensive analysis of meaningful activity patterns among GEM inpatients at a single Australian subacute hospital revealing significantly lower levels of meaningful activity compared to rehabilitation settings. Findings highlight the importance of communal spaces in promoting physical, cognitive and social activities. Staff should support patients to spend time in these shared spaces to increase opportunity for engagement in meaningful activities. These results serve as a foundation for developing evidence-based strategies to enhance meaningful activity in GEM settings. Future research should focus on implementing and evaluating interventions that optimise the use of available spaces, address weekend activity disparities and tailor activities to the unique needs of the GEM population. Our findings should also be validated in other subacute GEM settings globally, to account for variances in ward-based culture and practices.

Data Availability: The authors confirm that the data supporting the findings of this study are available within the article [and/or] its supplementary materials.

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