Examining the factors associated with community ambulation in an older adult day hospital population

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Received: 21 December 2021 / Accepted: 1 June 2022 / Published online: 5 July 2022
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Key Summary Points
Aim To examine the factors associated with community ambulation in community dwelling older adults attending a day hospital.
Findings Self-efficacy and gait speed were found to be independently associated with community ambulation in community dwelling older adults attending a day hospital. The associations between an individual’s physical ability, psychological well-being and their participation in community ambulation, highlight the importance of completing a holistic assessment of this population.
Message The findings demonstrate the complexity and multifactorial nature of community ambulation suggesting the need to adopt a broader approach to the management of older adults, to promote the achievement of independent community ambulation.

Abstract
Purpose The ability of an older adult to walk independently in their community assists with maintaining independence, a healthy lifestyle and a good quality of life. In clinical practice, outdoor mobility is often one of the first activities, where a decline is observed. The aim of this study was to examine the factors associated with community ambulation in community dwelling older adults attending a day hospital.
Methods This was a cross-sectional observational study design. Inclusion criteria were community dwelling older adults, over 65 years, attending a day hospital and able to ambulate at least 10 m with or without an assistive device. The primary outcome measure was a community ambulation questionnaire. A range of other outcome measures were completed assessing motor, cognitive, executive function and behavioural domains. Multivariate logistic regression was employed to identify independent predictors of community ambulation.
Results 161 participants completed this study. The median age was 83 years (IQR 9), 64% were female and 49.1% lived alone. 55.3% of participants were classified as independent community ambulators. Mean gait speed was 0.8 m/s, median TUG score was 16.6 s and median frailty was 4 (IRQ 2) using the Clinical Frail Scale. Self-efficacy ($p < 0.001$) and gait speed ($p = 0.030$) were independently associated with community ambulation.
Conclusions The findings demonstrate the complexity and multifactorial nature of community ambulation in older adults. This suggests the need to adopt a broader approach to the management of older adults, to promote the achievement of independent community ambulation.

Keywords Community ambulation · Older adult · Self-efficacy · Gait speed

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Introduction

Ageing results in the progressive decline of the body systems and as such there is an age-related increase of frailty and comorbid diseases, such as heart conditions, diabetes, respiratory conditions and stroke [1]. These can result in functional decline, decreased quality of life, increased risk of hospitalisation and institutionalisation [2]. In the older adult population, mobility, defined as the ability to move around one’s environment, is one of the first activities in which an older adult becomes dependent [3]. Mobility limitations affect between one third and one half of adults aged over 65 years, affecting their general health and well-being [4]. The ability to independently walk outdoors in their community is a basic and extremely important aspect of daily life, assisting with the maintenance of a healthy lifestyle and a good quality of life [5].

Although there is no uniform definition of community ambulation in the literature, the general consensus states that community ambulation is the ability to walk outside the house, in the community, for the purposes of employment, social activity and recreation. Community ambulation has been defined as the ability to independently and confidently negotiate uneven terrain, private venues, shopping centres and other public venues [6]. A variety of terms have been used in the literature, such as community mobility [3, 7, 8], community ambulation [6, 9–13], community walking [14–16] and outdoor walking [17]. The literature suggests that the term ‘community mobility’ may imply walking, driving or public transport, whereas ‘community walking’, ‘outdoor walking’ and ‘community ambulation’ describe walking or locomotion outdoors.

Studies have investigated community ambulation in healthy community dwelling older adults who were cognitively intact and able to walk outdoors independently [6, 12]. In the absence of a reliable and valid measurement for community ambulation in an older adult population, these studies focussed on a number of domains of the International Classification of Functioning (ICF), namely, activity and participation. They highlighted that multiple factors contribute towards independent community ambulation in this healthy older adult population, such as gait performance, executive function, depression and self-efficacy. The literature reports the complexity of community ambulation and highlights that factors other than physical performance must be considered. Factors such as psychological and cognitive factors [6] and environmental factors [3] require consideration in an older person’s ability to participate in community ambulation. This is echoed in studies of community ambulation in other populations, such as stroke or Parkinson’s disease. Many studies in stroke used gait as a method of determining different levels of community ambulation [9, 18]. Gait speed has also been used as a measure to predict community ambulation in a cohort of community dwelling adults living with Parkinson’s disease, reporting that a gait speed of 0.88 m/s predicted 70% of participants as community walkers [15]. To date, most of the research investigating community ambulation in older adults has been performed in healthy community-dwelling populations and not in older adult populations attending a day hospital following a change or decline in their health and function. Difficulty with mobility, specifically outdoor community ambulation, is a common problem and often a major rehabilitative goal of those attending a day hospital service [19].

There is scarce literature relating to community ambulation of older adults who are attending an outpatient day hospital setting due to a decline in their function and what factors are involved in their ability to maintain independent community ambulation.

The aim of this study was to establish the prevalence and examine the factors associated with community ambulation in community dwelling older adults attending a day hospital service in Dublin, Ireland.

Methods

Study design

This was a cross-sectional study design conducted and reported in accordance with STROBE guidelines (2009).

Setting and participants

Participants were recruited from patients attending an older adult day hospital at a large, Irish urban teaching hospital in Dublin, Ireland, between November 2017 and December 2018. This is the largest teaching hospital in Ireland, servicing a catchment area with approximately 30,000 adults aged over 65 years. The day hospital is a 5-day ambulatory unit providing acute medical care and multi-disciplinary team (MDT) rehabilitation for older adults living within the catchment. The main purpose of our day hospital is to work with our patients and their caregivers to enable them remain in their own home environment and avoid hospital admission where possible. Approximately 1000 new patients are referred annually to the day hospital for comprehensive geriatric assessment (CGA) following a change or decline in their health and function. Referrals are received from a variety of both inpatient and outpatient Medicine for the Elderly services. These include post hospital discharge, Home FiRṣT (Medicine for the Elderly MDT based in the Emergency Department with the aim of avoiding hospital admission), ambulatory care services, such as Bone Clinic.
Procedure

On each patient’s initial visit, a medical assessment and the relevant multidisciplinary team referrals are completed by the medical team. If the patient was referred to physiotherapy, their medical chart was screened by the lead researcher and the gatekeeper [Clinical Nurse Manager (CNM) or Medical Registrar]. Patients meeting the eligibility criteria were invited to participate and provided with the participant information leaflet (PIL) by the gatekeeper or the lead researcher. Following participant recruitment and consent process, the participant was accompanied to the physiotherapy gym, where the assessment was completed by the lead researcher. All assessments were completed in the same sequence to ensure ease of repeatability and took between 60 and 90 min depending on the time taken for the participant to complete the tasks and if a rest period was required. Standardised instructions were applied for each measure. Ethical approval was granted by the Hospital and University Research Ethics Committees (2017-12-17 and REC 1513, respectively).

Assessments

Demographics

Basic demographic information was collected. Data included age, gender, marital status, living status, use of assistive mobility device indoors and outdoors, number of falls in the past 6 months, number of medications and co-morbidities and the Clinical Frailty Scale [20].

Primary research measure

Community Ambulation Questionnaire The Community Ambulation Questionnaire (CAQ) is a short, self-reported questionnaire developed by Lord et al. (2004) for use in the community dwelling stroke population to identify levels of unsupervised community ambulation (9). The CAQ has been used in previous community ambulation studies with post-stroke populations [9, 13, 16], however, has not been used in older adult community dwelling populations. Each participant was categorised into one of four community ambulation groups based on their answers. The four groups were: 1. Non ambulant outside the home; 2. Ambulant as far as the letterbox (within house boundary, e.g., as far as car, gate, footpath); 3. Ambulant in the immediate environment (e.g., within housing estate, local shop); 4. Ambulant in a shopping centre or places of interest (wider community, e.g., shopping centre, town centre or activities in community). Two small modifications were made to the questionnaire in our study: removal of the word stroke and the addition of specific definitions for each group in order to aid categorisation of participants.

Secondary research measures

Additional community ambulation questionnaires The Walking Ability Questionnaire (WAQ) is a short, self-reported questionnaire developed by Perry et al. to provide a more detailed assessment of the patient’s walking ability both in their home and in community [18]. Participants were asked to state their level of mobility entering and leaving 19 commonly used locations, eight within the home and 11 in community. Mobility was classified using a five-point numerical, ordinal scale: independent (4), supervision (3), assisted (2), wheelchair (1) or unable (0). The WAQ score ranges from 0 to 76, a higher number indicating a better functional ability. This questionnaire has been used in previous studies with community dwelling stroke populations [21], but not in the older adult community population.

The Hoffer Classification was initially designed in 1973 to classify functional ambulation in children with Spina Bifida into one of four categories: non-ambulatory, therapeutic, household and community ambulant. An expert clinical
group adapted and validated the Hoffer Classification for use in a community dwelling stroke population [18]. They established a total of six categories by removing the non-ambulatory level and increasing the household and community levels of ambulation and established specific criteria for each category. Again, no literature was available for the use of the Hoffer Classification in a community dwelling older adult population. The Perry et al. version of the Hoffer was used in this study [18]. Following completion of assessment, participants were categorised into one of the six categories: Physiological walker, Limited household walker, Unlimited household walker, Most limited community walker, Least limited community walker or Community walker.

Motor domain

The ten-metre walk test (10MWT) was used to assess usual walking speed in metres per second over a short distance. This test has been found to be a reliable measure of gait speed in older people, both inpatient and community dwelling [22]. Three trials of the test were performed, and the average calculated. Functional mobility was assessed using the Timed Up and Go test [23]. This is a commonly used falls screening tool for both inpatients and community dwelling older adults and has been shown to be a reliable and valid measure in community dwelling older adult populations [24]. A practice trial which was untimed was completed prior to completing the timed test. The Two Minute Walk Test (2MWT) was used to assess functional performance and endurance and has been used in many population groups including frail older inpatients, long term care residents and older adults living in retirement homes and has been found to be a valid and reliable measure in an older population and more tolerable than a six minute walk test [25]. It measures the distance walked in metres over a 2-min period. One timed test was completed.

Cognitive domain

Cognition was assessed using the Mini Mental State Examination (MMSE) which is a reliable measure for the older population [26]. The Trail Making Test (TMT) A and B was used to measure executive function [27].

Behavioural domain

Self-efficacy was measured using the Ambulatory Self-Confidence Questionnaire (ASCQ), a 22 item self-reporting, self-efficacy measure used to assess ambulatory confidence in different environmental situations both within the home (3 items) and outdoors in community (19 items). This measure was found to be a reliable and valid measure for use in community dwelling older adults [5].

The Hospital Anxiety and Depression Scale (HADS) was used to measure anxiety and depression. This measure has been shown to be valid and reliable in the screening for anxiety and depression in adults, including older adults, both in hospitals and community settings [28, 29]. This is a self-reporting questionnaire and consists of 14 items, seven items for the anxiety section and seven items for the depression section.

Statistical analysis

The planned sample size was based on Peduzzi et al. and the calculation of 10 observations per variable for the regression model principle, giving a study sample estimated at 160 participants [30]. SPSS software (Version 25.0) was used to analyse the data. Statistical significance was set at $p < 0.05$. The distribution of data was assessed for normality using the one sample Kolmogorov–Smirnov test. Descriptive statistics were used to describe demographics characteristics and outcome measures for the total population. The three community ambulation measures (CAQ, WAQ, Hoffer Classification) were correlated using Spearman’s rho coefficient. The sample was then dichotomised into non-community or community ambulant. Bivariate comparison analysis was completed to determine if there was a statistically significant difference between each of the variables in each group. Parametric methods ($t$ test) were used to analyse normally distributed variables and non-parametric methods (Mann–Whitney $U$ test) used to analyse non-normally distributed variables. The mean and standard deviation or median and interquartile range was calculated for each variable. Multivariate logistic regression analysis was carried out to examine which variables were independently associated with community ambulation.

Results

A total of 161 participants consented and completed the study (Fig. 1). The participants in this study had a median age of 83 years with an age range between 65 and 97 years. Female participants represented 64% of the study sample and 49.1% of the participants lived alone. A walking aid was used indoors by 41.6% and outdoors by 70.2% of participants. Over half of participants (54%) reported having a fall in the past 6 months with the number of falls ranging from zero to ten and a median of one. The median number of comorbidities was six, with the most common being hypertension, atrial fibrillation, arthritis, osteoporosis,
stroke, Parkinson’s disease. A summary of demographic information is shown in Table 1.

The median MMSE was 27, with low levels of anxiety and depression reported. Median TUG score was 16.6 s, indicating falls risk. Mean gait speed was 0.8 m/s. Table 2 provides full details of outcome measures for the study population, including the number of participants included in the analysis. Analysis of participants compared to non-participants showed them to be similar in terms of age and gender, but non-participants had TUG scores 2.36 s slower than the participants.

Classifcation of community ambulation

The three community ambulation measures (CAQ, WAQ, Hoffer Classification) were strongly intercorrelated, with Spearman’s rho coefficients above 0.6. Only one measure was, therefore, chosen to determine levels of community ambulation—Community Ambulation Questionnaire (CAQ). Based on results from the CAQ, participants were classified into one of four groups of community ambulation: 34.8% were classified as independent community ambulators (group 4), 20.8% were limited community ambulators (group 3) and 44.7% were deemed non-community ambulators (group 1 and 2). Participants were then dichotomised into two groups as had been completed in previous studies [9, 16]. Participants in both group 3 and group 4 were classified as independent community ambulators (55.3%, n = 89) and the remaining 44.7% (n = 72) were classified as non-community ambulators.

Bivariate comparison analysis

Once participants were dichotomised, bivariate comparison analysis was used to determine if there was a difference between the two groups for each variable. The variables as presented in the methodology were split into subsections creating 28 variables. Analysis showed there was a statistically significant difference between fifteen of the 28 variables (Table 3).

Multivariate binary logistic regression analysis

All data was reviewed and allowing for missing data, 151 cases from a total of 161 cases were included in the multivariate binary logistic regression analysis. Overall the study had minimal missing data (6.2%). Executive Function (EF) had the most amount of missing data, with 6% of EF data missing (152/161). Fifteen variables were found to be significantly associated (p ≤ 0.05) with community ambulation on the bivariate comparison analysis. We entered in the multivariate model characteristics that were significant or had a trend toward significance on bivariate analyses and were not intercorrelated amongst themselves (gait speed, TUG). Age was entered into the analysis as although it was not shown to be significantly associated with community ambulation in the bivariate analysis, it is an important personal demographic is this study of the older adult. Two models were analysed initially, one with TUG and one with gait speed. Both models showed that frailty and self-efficacy were the only factors significantly associated with community ambulation. Due to frailty being so strongly associated with the outcome, it was not possible to look at the contributions of physical factors, cognition and mood given our sample size. A secondary model without CFS was performed to look at these factors in more detail. It is noted once CFS is removed, functional mobility, measured using TUG (p = 0.334), cognition measured by TMT-A (p = 0.196) and mood measured by HADS-A (p = 0.869) and HADS-D (p = 0.769) remained non-significant. Secondary analysis excluding CFS and including gait speed showed that gait speed was significantly associated with community ambulation (p = 0.030). This model also showed that cognition measured by TMT-A (p = 0.287), mood measured by HADS-A (p = 0.904) and HADS-D (p = 0.757) remained non-significant. Table 4 shows the final statistical analysis model.

Discussion

The key findings of this quantitative study were that walking speed and self-efficacy were independently associated with community ambulation in a community dwelling older adult population who were attending a rehabilitation day hospital due to a change or decline in their health or functional ability.

The literature suggests that multiple factors can impact on the ability of an older adult to walk outdoors [31]. Factors such as a fear of falling [32], health-related issues both physical (pain, strength, gait speed, dyspnoea) and psychological (fear, depression) [33] and environmental factors [34] can all impact on an older adults ability to ambulate in community, demonstrating the complexity and multifactorial nature of this task. Our findings identified the associations between an individual’s physical ability, psychological well-being and participation in community ambulation and highlights the importance of completing a holistic assessment of this population.

This study highlighted the impact of gait speed on an older person’s ability to walk in community. The mean gait speed for the total study population was 0.8 m/s. Once dichotomised into community and non-community ambulators there was a significant difference between groups, with a higher gait speed significantly associated with independent
Number referred to day hospital  
n = 854

Attended for initial medical assessment  
n = 616

Referred to physio and screened  
n = 558

Excluded (n=153)
43 — Did not attend
33 — Unable to give consent
28 — Medically unfit
24 — Unable to mobilise 10ms
12 — Visual deficit
7 — Communication difficulties
5 — Already participated
1 — Under 65 years old

Number eligible for inclusion  
n = 405

Not approached or invited to participate due to resources  
n = 230

Approached and invited to participate  
n = 175

Consented and participated  
n = 161

Did not consent to participate  
n = 14

Complete data and included in final model  
n = 151

Missing data for final model (n=)
9 — TMT A
1 — 10MWT
2 — ASCQ
2 — HADS - A
2 — HADS - D

Fig. 1 Flow of participants
community ambulation. Gait speed is a widely used tool in older adult clinical settings and a good indicator of the health and functional ability of older adults, predicting hospitalisation, mortality risk [35], falls risk [36] and frailty [37]. A cut off score of 0.8 m/s is often used as indicator of sarcopenia [38] and community ambulation [39] and our finding of an association between gait speed and prediction of ambulation category was expected. An important finding was that 44.7% of our study participants were classified as non-community ambulators. Their average gait speed of 0.6 m/sec highlights the high number of at risk population attending our services [35]. It is important that this is communicated clinically as part of a CGA, identifying if further investigations are required to ascertain the cause of slow walking and plan evidence-based care programmes, designed to improve the functional ability and health outcomes of this specific population. Previous research has identified determinants of gait, such as age, gender and strength [40]. Modifiable factors such as strength are important to address in clinical setting as improvements at impairment level may lead to improvement in walking speed and overall function and participation in community ambulation. The literature indicates that many measures such as 4MWT, 6MWT, 10MWT and TUG have been used to assess gait speed. Following multivariate

Table 1: Baseline description of the study participants (n = 161)

| Variable                                | Value   |
|-----------------------------------------|---------|
| Age, years, median (IQR)                | Range 65–97 83 (9) |
| Gender, n (%)                           | Male 58 (36) |
|                                         | Female 103 (64) |
| Marital status, n (%)                   | Married 58 (36) |
|                                         | Widowed 68 (42.2) |
|                                         | Single 35 (21.7) |
| Living status, n (%)                    | Lives alone 79 (49.1) |
|                                         | Lives with spouse 43 (26.7) |
|                                         | Lives with other 39 (24.2) |
| Walking aid indoors, n (%)              | Unaided 94 (58.4) |
|                                         | Stick 38 (23.6) |
|                                         | Frame/other 29 (18.0) |
| Walking aid outdoors, n (%)             | Unaided 48 (29.8) |
|                                         | Stick 48 (29.8) |
|                                         | Frame/other 65 (40.4) |
| Falls in past 6/12, n (%)               | Yes 87 (54) |
| No of falls in past 6/12, median (IQR)  | Range 0–10 1.00 (1) |
| No of medications, median (IQR)         | Range 1–22 7 (5) |
| Polypharmacy, n (%)                     | Yes 127 (78.9) |
| Co Morbidities, median (IQR)            | Range 0—16 6 (4) |
|                                         | Hypertension, n (%) 88 (54.6) |
|                                         | Atrial fibrillation, n (%) 43 (26.7) |
|                                         | Arthritis, n (%) 42 (26.1) |
|                                         | Osteoporosis, n (%) 40 (24.8) |
|                                         | Parkinson’s disease, n (%) 30 (18.6) |
|                                         | Stroke, n (%) 28 (17.4) |

IQR inter quartile range, % percentage, Polypharmacy 5 or more medications

Table 2: Outcome measures for total study population

| Outcome measure                              | Value               | n |
|----------------------------------------------|---------------------|---|
| MMSE, median (IQR)                           | 27 (5)              | 157|
| TMT-A (s), median (IQR)                      | 78.4 (53.5)         | 152|
| TMT-B (s), median (IQR)                      | 264.1 (143.1)       | 152|
| TMT-Delta (s), median (IQR)                  | 132.7 (117.7)       | 152|
| TUG (s), median (IQR)                        | 16.6 (11.4)         | 160|
| 10MWT (s), median (IQR)                      | 8.0 (5.0)           | 160|
| Gait speed (m/s), mean (SD)                  | 0.8 (0.3)           | 160|
| 2MWT (m), mean (SD)                          | 74.2 (32.5)         | 156|
| ASCQ, mean (SD)                              | 131.1 (47.2)        | 159|
| HADS-A, median (IQR)                         | 5 (8)               | 159|
| HADS-D, median (IQR)                         | 4 (5)               | 159|
| HADS-total, median (IQR)                     | 9 (12)              | 159|
| CFS, median (IQR)                            | 4 (2)               | 161|

IQR inter quartile range, SD standard deviation, s seconds, MMSE Mini Mental State Examination, TMT-A Trail Making Test A, TMT-B Trail Making Test B, TMT-Delta Trail Making Test B–A, TUG Timed Up and Go, 10MWT 10 Metre Walk Test, 2MWT Two Minute Walk Test, ASCQ Ambulatory Self Confidence Questionnaire, HADS-A Hospital Anxiety and Depression Scale-Anxiety, HADS-D Hospital Anxiety and Depression Scale-Depression, HADS-Total Hospital Anxiety and Depression Scale, CFS Clinical Frailty Scale
analysis, our findings suggest that clinicians should consider gait speed as measured by the 10MWT is a more relevant measure to determine community ambulation in older adults than the TUG.

Another significant finding was that self-efficacy was independently associated with community ambulation, those with higher levels of self-efficacy more likely to be independent community walkers. Self-efficacy is an individual’s self-belief to perform a task and is often measured in clinical settings to provide additional information to complement objective performance measures. These results concur with previous research in the area, which suggests that self-efficacy and confidence may influence an older adult’s ability to undertake independent community ambulation and participate in community based activities [6]. It is well documented that fear of going outdoors is common in older adults, with an increased risk of developing further difficulties in walking due to inactivity and deconditioning [41].

Interestingly, other variables such as cognitive, executive function and depression although trending towards significant on bivariate analysis, did not emerge as independent predictors of community ambulation in our study. This may be explained by the overall sample displaying good cognitive ability on MMSE and displaying low levels of depression. Similarly, a recent study highlighted depression as an important factor in outdoor walking, reporting that although

| Variable                                      | Non-community ambulators (n = 72) | Independent community ambulators (n = 89) | p value |
|-----------------------------------------------|-----------------------------------|------------------------------------------|---------|
| Age, median (IQR)                             | 83.5 (8)                          | 82 (9)                                   | 0.186^  |
| Female gender (%)                             | 72.2                              | 57.3                                     | 0.050*  |
| Lives alone (%)                               | 41.7                              | 55.1                                     | 0.091*  |
| Lives with spouse (%)                         | 26.4                              | 27.0                                     | 0.934*  |
| Lives with other (non-spouse) (%)             | 31.9                              | 18.0                                     | 0.040*  |
| No assistive device indoors (%)               | 29.2                              | 82.0                                     | <0.001* |
| Stick indoors (%)                             | 34.7                              | 14.6                                     | <0.003* |
| Frame or other indoors (%)                    | 36.1                              | 3.4                                      | <0.001* |
| No assistive device outdoors (%)              | 11.1                              | 44.9                                     | <0.001* |
| Stick outdoors (%)                            | 22.2                              | 36.0                                     | 0.058*  |
| Frame or other outdoors (%)                   | 66.7                              | 19.1                                     | <0.001* |
| Falls in the past 6/12 (%)                    | 55.6                              | 52.8                                     | 0.728*  |
| No. of falls in past 6/12, median (IQR)       | 1 (2)                             | 1 (1)                                    | 0.217*  |
| No. of medications, median (IQR)              | 8 (6)                             | 7 (6)                                    | 0.167*  |
| Polypharmacy (%)                              | 83.3                              | 75.3                                     | 0.213*  |
| No. of comorbidities, median (IQR)            | 7 (4)                             | 6 (4)                                    | 0.056*  |
| MMSE, median (IQR)                            | 27 (5)                            | 26 (5)                                   | 0.610*  |
| TMT A (s), median (IQR)                       | 91.7 (68)                         | 73.5 (50.9)                              | 0.003*  |
| TMT B (s), median (IQR)                       | 272 (120.9)                      | 249.6 (158)                              | 0.325*  |
| TMT Delta (s), median (IQR)                   | 123 (111)                        | 146.1 (119)                               | 0.083*  |
| TUG (s), median (IQR)                         | 21.7 (13.8)                      | 13.8 (7.6)                               | <0.001* |
| 10MWT (s), median (IQR)                       | 10.3 (5.2)                       | 6.4 (3.3)                                | <0.001* |
| Gait speed (m/s), Mean (SD)                   | 0.61 (0.24)                      | 0.92 (0.33)                              | <0.001* |
| 2MWT (m), mean (SD)                           | 56.7 (25.7)                      | 88.8 (30.3)                              | <0.001* |
| ASCQ, mean (SD)                               | 99.9 (44.3)                      | 155.6 (33.0)                             | <0.001* |
| HADS-A, median (IQR)                          | 6 (8)                            | 4 (6)                                    | 0.038*  |
| HADS-D, median (IQR)                          | 4.5 (6)                          | 3 (4)                                    | 0.010^  |
| CFS, median (IQR)                             | 5 (1)                            | 3 (1)                                    | <0.001* |

IQR interquartile range, SD standard deviation, s seconds, m/s metre per second, MMSE Mini Mental State Examination, TMT-A Trail Making Test A, TMT-B Trail Making Test B, TMT-Delta Trail Making Test B-A, TUG Timed Up and Go, 10MWT 10 Metre Walk Test, 2MWT Two Minute Walk Test, ASCQ Ambulatory Self Confidence Questionnaire, HADS-D Hospital Anxiety and Depression Scale-Drop, HADS-D Hospital Anxiety and Depression Scale-Depression, HADS-Total Hospital Anxiety and Depression Scale, CFS Clinical Frailty Scale, Polypharmacy 5 or more medications

^Mann–Whitney U test; *Chi-squared test; °*t test
The Community Ambulation Questionnaire (CAQ) was developed for use in the stroke population. Assessor bias was considered, and the researchers made two modifications as it was utilised, the researchers made two modifications as it was developed for use in the stroke population. Assessor bias cannot be ruled out as all assessments were completed by the lead researcher. We were not able to include all eligible patients in the study; therefore, as the participants were faster than the non-participants, the true prevalence of Community Ambulation is, therefore, likely lower than what this study found.

There were some limitations to this study. This study was conducted in an urban hospital single centre, so caution is recommended in the generalisation of the findings. The Community Ambulation Questionnaire (CAQ) was utilised, the researchers made two modifications as it was developed for use in the stroke population. Assessor bias cannot be ruled out as all assessments were completed by the lead researcher. We were not able to include all eligible patients in the study; therefore, as the participants were faster than the non-participants, the true prevalence of Community Ambulation is, therefore, likely lower than what this study found.

This study demonstrates the complexity and multifactorial nature of independent community ambulation and to achieve optimal outcomes in future practice, this study highlights the importance of addressing self-efficacy in tandem with the individual’s physical needs and should feature in the design and implementation of care programmes. The role of the physiotherapist is central to this approach in partnering with the multidisciplinary team and the engagement of external agencies. Together they ensure that community-dwelling older adults can achieve optimal levels of health and quality of life allowing them to live independently and successfully within age-friendly communities.
Acknowledgements The authors would like to thank all study participants.

Author contributions BC and FH conceptualised and designed the study. Data collection was performed by BC. Data analysis was performed by BC, FH, CC and RRO. The first draft of the manuscript was written by BC. FH, CC, RRO and Niamh Murphy (NH) contributed to the editing and reviewing the paper. All authors read and approved the final manuscript.

Funding This research study was supported by a small educational Grant from Medicine for the Elderly Directorate and Centre for Learning and Development, St James’s Hospital, Dublin 8, Ireland.

Availability of data and materials The data sets used for this study are available upon reasonable request from the corresponding author.

Code availability Codes and statistical analysis are available upon reasonable request from the corresponding author.

Declarations

Conflict of interest We declare there are no conflicts of interest or copyright conflict. We declare that this work arises from an MSc Research thesis completed by the lead author BC, this thesis is available in the Royal College of Surgeons Ireland thesis repository as follows https://repository.rcsi.com/articles/thesis/Examining_the_Factors_Associated_with_Community_Ambulation_in_an_Older_Adult_Day_Hospital_Population/15035445.

Ethical approval This study was approved by St James’s Hospital and Tallaght University Hospital Joint Research Ethics Committee (REC 2017-06) and the Royal College of Surgeons in Ireland (RCSI) Research Ethics Committee (REC 1513).

Consent to participate Written informed consent was obtained from all participants.

Consent for publication Consent for dissemination/publication was obtained. The manuscript does not contain individual case sensitive information.

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