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Title page

Feasibility of the Tailored Activity Program to Bridge Hospital and Community Care for People Living with Dementia and Behavioral Disorders: The "Continu-A-Mente" Project

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Abstract (348 words)

Background

The Tailored Activity Program (TAP) effectively manages Behavioral and Psychological Symptoms of Dementia (BPSD), yet its feasibility across the hospital-to-home care continuum for people living with dementia (PLwD) has not been tested.

Objective

To assess the feasibility of TAP-Continu-A-Mente intervention for managing BPSD in PLwD transitioning from hospital to home, either following a short-stay observation or a memory clinic evaluation. Secondary aims were to evaluate changes in PLwD BPSD, caregiver distress and sense of competence, healthcare use, dyad satisfaction.

Methods

This single-arm interventional feasibility study enrolled 50 dyads (PLwD and caregivers) at IRCCS San Gerardo Hospital (Monza, Italy). PLwD inclusion criteria were age ≥65, dementia diagnosis, Neuropsychiatric Inventory (NPI) ≥6 in at least one item, independence in at least two basic activities of daily living, fluency in Italian. The intervention consisted of eight sessions over three months (two in hospital and six at home) delivered by occupational therapists. The primary outcome was the proportion of dyads completing the program (dyad retention). Secondary outcomes, assessed at baseline and four months, included NPI, Clinical Frailty Scale (CFS), motor-functional status (Katz Index, TUG), caregiver self-efficacy (SCQ), and dyad satisfaction.

Results

PLwD had a median age of 81 (Q1–Q3: 77–86), and 52% were female. Patient baseline median CFS was 6 (Q1–Q3: 6–7), and 78% received ≥12 hours/day of caregiver assistance. Caregivers were mostly female (76%) with a median age of 59 (Q1–Q3: 55.5–74). Dyad retention was 84% (42/50), with dropouts mainly older females. Among completers, NPI total scores decreased at follow-up (frequency x severity 42.5 vs 20.5, and caregiver distress 21 vs 14; $p < 0.001$), while SCQ score increased (52 vs 65; $p < 0.001$). CNS-active medication use increased overall, from 1 to 2. Katz Index declined from 4 to 3, whereas TUG remained stable (15.5 vs 16.3). No institutionalizations occurred, and one hospitalization was recorded. More than half of patients and caregivers rated their experience as 5/5.

Conclusions

TAP-Contin-A-Mente was a feasible hospital-to-home model of care for PLwD with BPSD. The observed reductions in NPI scores should be considered hypothesis-generating, warranting further investigation.

Trial registration: The study protocol was approved by the Ethics Committee “Comitato Etico Brianza” (approval no. 4173, 12.01.2023).

Keywords: Dementia; BPSD; Occupational Therapy; Rehabilitation; Tailored Activity Program.

Background

Epidemiological studies indicate that nearly all people living with dementia (PLwD) experience at least one Behavioral and Psychological Symptom in Dementia (BPSD) during the disease course (1,2). Also referred to as non-cognitive symptoms of dementia, BPSD encompass a broad range of disturbances in perception, thought and behavior (3). Common manifestations include anxiety, irritability, aggression, apathy, depression, euphoria, psychotic symptoms, abnormal motor activity, and disordered eating (4). BPSD have substantial clinical impact, accelerating cognitive decline, increasing caregiver burden and burnout risk, reducing quality of life, contributing to earlier institutionalization, and raising healthcare costs (5-8).

These symptoms arise from multiple interacting factors, including structural brain changes that impair cognitive and emotional regulation, thereby reducing patients' adaptive responses to environmental and interpersonal stressors (9). Such maladaptive behaviors often heighten caregiver stress and may result in harmful interactions (10). Since BPSD frequently stem from patient's reduced ability to interpret environmental cues and from challenges in caregiver–patient interactions, pharmacological treatments are often of limited benefit and recommended only for a minority of symptoms (11). Nonetheless, psychotropic medications remain widely prescribed (12,13).

PLwD also often experience inappropriate outpatient visits and emergency department referrals due to behavioral disturbances, with or without concurrent acute medical illness (14,15). In acute hospitals, a recent meta-analysis reported a pooled prevalence of BPSD of 60% among older inpatients with dementia, with higher psychotropic medication use, increased caregiver

distress, and repeated emergency visits and hospital readmissions due to poor patient–staff interactions and fragmented discharge planning (16). Transitions from hospital to home represent a particularly critical period for both PLwD and caregivers, during which behavioral symptoms frequently intensify and care fragmentation increases (17,18). Collectively, these findings underscore a persistent gap between evidence-based recommendations and real-world practice, highlighting the urgent need for feasible, non-pharmacological strategies that can be effectively implemented across care transitions.

The Tailored Activity Program (TAP) is a standardized occupational therapy intervention that adapts meaningful activities to the abilities and interests of PLwD while training caregivers in activity implementation and stress management techniques (19,20). TAP has demonstrated efficacy in community settings (21), and feasibility in hospital environments (22), yielding improved caregiver skills, reduced caregiver burden, and potentially decreased healthcare use. However, its feasibility within a hospital-to-home care model for managing acutely challenging BPSD remains unexplored.

This study assessed the feasibility of TAP-Continu-A-Mente, a hospital-to-home transitional care intervention for PLwD with BPSD, after either a short-stay observation or a memory clinic evaluation. Secondary objectives were to evaluate changes in PLwD BPSD, caregiver distress and sense of competence, healthcare service use, and dyad satisfaction.

Methods

Study design and setting

The “Continu-A-Mente” project is a single-arm, interventional feasibility study conducted at the IRCCS San Gerardo dei Tintori (Monza, Italy). The study

protocol was approved by the Ethics Committee “Comitato Etico Brianza” (approval no. 4173, 12.01.2023). Written informed consent was obtained from all participants and their caregivers prior to enrollment. A detailed description of the intervention protocol has been previously published (23).

Participants

Eligible participants were dyads consisting of a PLwD and their caregiver. PLwD were recruited from either the hospital Short Stay Observation Unit (SSOU) of the Acute Geriatric Unit (24), during referral for acute medical illness, or the hospital memory clinic. PLwD inclusion criteria were age ≥65 years, a diagnosis of dementia, Neuropsychiatric Inventory (NPI) score ≥6 in at least one item at baseline, independence in at least two basic activities of daily living (ADLs), and fluency in Italian. Each PLwD was required to have a caregiver aged ≥21 years providing home care. Exclusion criteria for patients included schizophrenia, bipolar disorder, dementia secondary to traumatic brain injury, inability to ambulate or prolonged (≥12 hours/day) wheelchair dependence, and an estimated life expectancy <6 months, as judged by a geriatrician. Caregiver exclusion criterion was age < 21 years.

Intervention and delivery

The TAP intervention consisted of eight structured sessions, each lasting 60 to 90 minutes, delivered over three months. Implementation was carried out by two occupational therapists (OTs), both formally trained in the standardized TAP methodology (25): one based in the Acute Geriatric Unit and the other working in the community setting.

The first two sessions took place in the hospital (SSOU or memory clinic), and the remaining six sessions were conducted at the patient’s home with support

from a multidisciplinary team including a nurse and a geriatrician, as previously described (23). Hospital sessions focused on assessing the PLwD's cognitive and functional abilities, interests, daily routines, environmental context and caregiver communication style and availability. Structured handovers between hospital and community OTs were conducted within 24–72 hours after the second in-hospital session to ensure continuity of care (23). The handover was sent by email from the hospital OT to the community OT. It included a structured summary of the key information needed to plan and deliver home sessions: patient identifiers and discharge setting/date; functional profile and main ADL limitations; key BPSD symptoms and triggers; communication considerations; and environmental/home-context notes when available. It also outlined goals and priorities agreed with the dyad, along with a proposed initial session plan. Practical recommendations were provided on activity adaptation, environmental modifications, caregiver training strategies, and safety considerations. Where required, a brief follow-up phone call between OTs took place after the first home visit to align early observations and refine the shared plan. Overall, this standardized handover typically took 15 minutes, minimizing information loss and supporting a seamless transition from hospital- to home-based delivery.

The home-sessions aimed to identify and adapt three meaningful activities to the PLwD's preserved abilities and home environment. Caregivers were actively involved, receiving practical training through observation, guided practice, and written instructions. Environmental modifications (e.g., decluttering, optimized lighting) were implemented to enhance activity engagement.

The final two home sessions focused on generalizing strategies to address other common care challenges (e.g., bathing, grooming, managing challenging behaviors), complemented by educational content on dementia care and stress management.

Compared with the original TAP, our adaptation was mainly organizational: we maintained the core TAP content components but delivered the program by two OTs across hospital and home/community settings, supported by a structured OT-to-OT handover to ensure continuity.

Baseline assessment

At in-hospital enrollment, research staff collected baseline data through patient evaluation and caregiver interviews, including sociodemographic information (age, sex, education, marital status), level of home care, frailty (Clinical Frailty Scale, CFS), polypharmacy (≥7 medications) and use of central nervous system-active (CNS-active) medications. BPSD were assessed using the NPI (26) via a structured caregiver interview. For each domain, the score was calculated by multiplying frequency (1–4) by severity (1–3), with the total NPI score obtained by summing all domain scores; higher totals indicate greater symptom burden. Caregivers also rated their own distress for each symptom on a scale from 0 (not at all) to 5 (very severe), and a total caregiver distress score was computed. This approach captured both patient symptomatology and caregiver emotional impact. The research staff also assessed independence in ADLs using the Katz Index, based on caregiver report (27). Fall risk and motor performance were evaluated using the Timed Up and Go (TUG) test (28). Finally, caregiver self-perceived competence was measured with the Sense of Competence Questionnaire (SCQ). The total score ranges from 27 to 135, with higher scores

indicating greater caregiver sense of competence, consistent with prior literature and community-based occupational therapy trials in dementia (29–31).

Outcomes

Research staff conducted follow-up assessments four months after enrollment. The primary outcome was dyad retention, defined as the proportion of dyads completing the program by four-month follow-up. Secondary outcomes included changes from baseline in BPSD severity and caregiver distress (NPI), motor and functional status (TUG, Katz Index), and caregiver sense of competence (SCQ). In addition, data were collected on new hospitalizations and emergency department visits. Dyad satisfaction was rated by using a 5-point Likert scale (0 = not at all satisfied; 5 = very satisfied).

Statistical analysis

Descriptive statistics summarized participant characteristics and feasibility indicators (refusal, dropout, adherence). Categorical variables were reported as absolute frequencies and percentages (n, %), while continuous variables were expressed as medians with interquartile ranges (Q1–Q3). Within-subject changes from baseline to follow-up were tested using the Wilcoxon signed-rank test for continuous outcomes and the exact McNemar test for paired binary outcomes. Between-group baseline comparisons were performed using the Mann–Whitney U test for continuous variables and the chi-squared test, or Fisher's exact test, as appropriate, for categorical variables. All p-values were two-sided, with statistical significance set at $p < 0.05$. Analyses were conducted using STATA version 16 (StataCorp, College Station, TX).

Results

Sample Characteristics

From 79 dyads screened and fully assessed for eligibility, fifty dyads were finally enrolled (Supplementary Figure 1). Table 1 shows the PLwD's main characteristics at baseline.

Variables	**Total sample (N=50)**
Age (years)	81 (77-86)
Sex (female)	26 (52%)
Recruitment setting	
Hospital memory clinic	29 (58%)
Hospital Short Stay Observation Unit	21 (42%)
Level of education	
Primary school	28 (56%)
Secondary school	8 (16%)
High school	7 (14%)
University	7 (14%)
Marital status, n (%)	
Married	34 (68%)
Widowed	16 (32%)
Level of care at baseline, n (%)	
≥12 hours/day	39 (78%)
4-12 hours/day	9 (18%)
≤3 hours/day	2 (4%)
CFS	6 (6 – 7)
Polypharmacy, n (%)	23 (46%)
CNS-active medications, n (%)	
0	16 (32%)
1	13 (26%)
2	16 (32%)
≥3	5 (10%)

Legend: Values are reported as n (%) or median (Q1-Q3). CFS= Clinical Frailty Scale; CNS= Central nervous system.

They had a median age of 81 years (Q1-Q3: 77–86) and 52% were female. Over half of patients (56%) were recruited from the memory clinic, while the remaining were enrolled from the SSOU (44%) (baseline comparison included in Supplementary Table 1). Educational attainment was generally low: 62% had completed only primary school education; 16% lower secondary school, and 14% each completed upper secondary school or held a university degree. Most patients were married (68%), while 32% were widowed or separated. A large proportion (78%) received over 12 hours of daily care, with 18% receiving 4-12 hours, and only 5% receiving less than 3 hours. Clinically, PLwD were moderately to severely frail (median CFS score 6; Q1-Q3: 6–7), and polypharmacy was common (46%). At baseline, 32% were not prescribed CNS-active medications, 26% had one, 32% had two, and 10% three or more medications. Caregivers had a median age of 59 years (Q1–Q3: 55.5–74), 76% were female, and most (64%) were children of the patient.

Feasibility

Feasibility was defined as dyad retention in the study, indicated by completion of the baseline assessment, all intervention sessions, and the 4-month follow-up. Overall, 42 dyads (84%) completed the study; among completers, session completion was 100% (all eight sessions). Session duration was tailored to dyad needs within the pre-specified range, and the recorded direct contact time per session was typically 60 minutes with limited deviations (occasional longer sessions up to 75 min). The balance between PLwD- and caregiver-focused components varied minimally across dyads: the median duration of the PLwD and caregiver components was 30 minutes each (Q1–Q3: 25–40 and 20–35, respectively). Eight (16%) dyads withdrew—six for logistical reasons related to

relocations over 20 km, one due to activation of palliative care, and one due to patient death. Dropout patients were significantly older (median age: 83.5 years, Q1–Q3: 81.0–87.5), all female, and more frequently recruited from the hospital SSOU. No other baseline characteristics—including education, frailty, level of home care, or polypharmacy—differed significantly between completers and dropouts (Supplementary Table 2).

Secondary outcomes

Table 2 shows baseline-to-follow-up changes in secondary outcomes for dyads who completed the study.

Variable	**Baseline**	**Follow-up**	**p-value**
NPI (frequency x severity)	42.5 (17 – 60)	20.5 (12 – 30)	<0.001
NPI (caregiver distress)	21 (11 – 30)	14 (7 – 19)	<0.001
TUG, seconds	15.5 (13 – 28)	16.3 (12 – 30)	0.505
Katz Index	4 (3 – 5)	3 (2 – 5)	0.002
N° CNS-active medications	1 (0 – 1)	2 (1 – 2)	0.008
SCQ	52 (45 – 62)	65 (59 – 68)	<0.001

Legend. Values are reported as median (Q1-Q3). NPI= Neuropsychiatric Inventory; TUG = Timed Up and Go Test; CNS: Central nervous system; SCQ= Sense of Competence Questionnaire

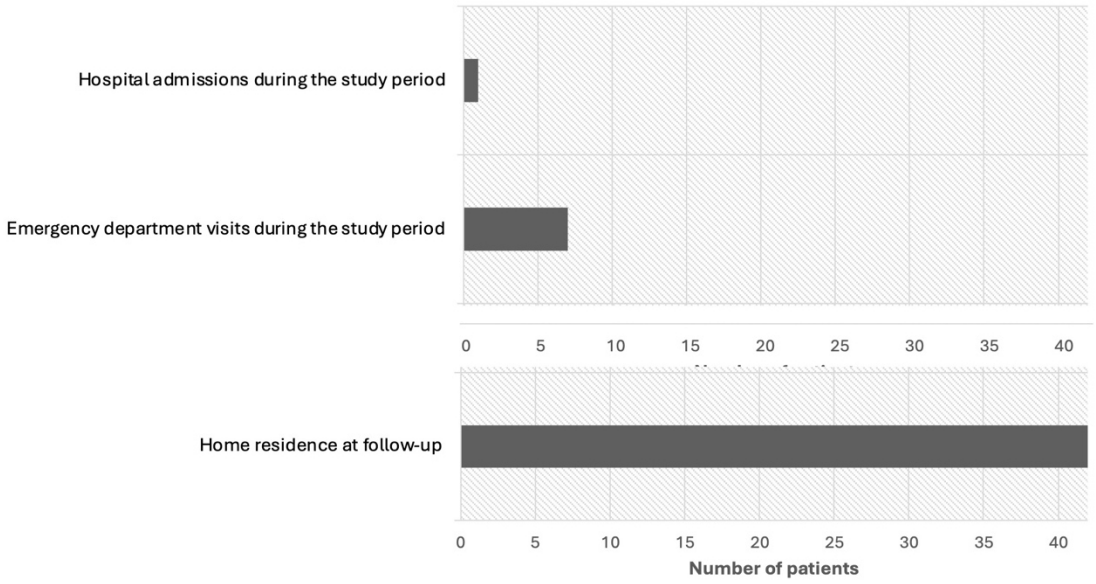
A reduction in the total NPI (frequency x severity) median scores was observed, from 42.5 (Q1–Q3: 17–60) to 20.5 (Q1–Q3: 12–30) ($p < 0.001$). At the NPI item level, apathy/indifference, irritability/lability, and agitation/aggression were the most frequent symptoms with item scores ≥6 at baseline and showed significant reductions in the proportion of participants meeting this threshold, together with appetite/eating disturbances, anxiety, aberrant motor behavior, and sleep/night-time behavior disturbances (Supplementary Table 3).

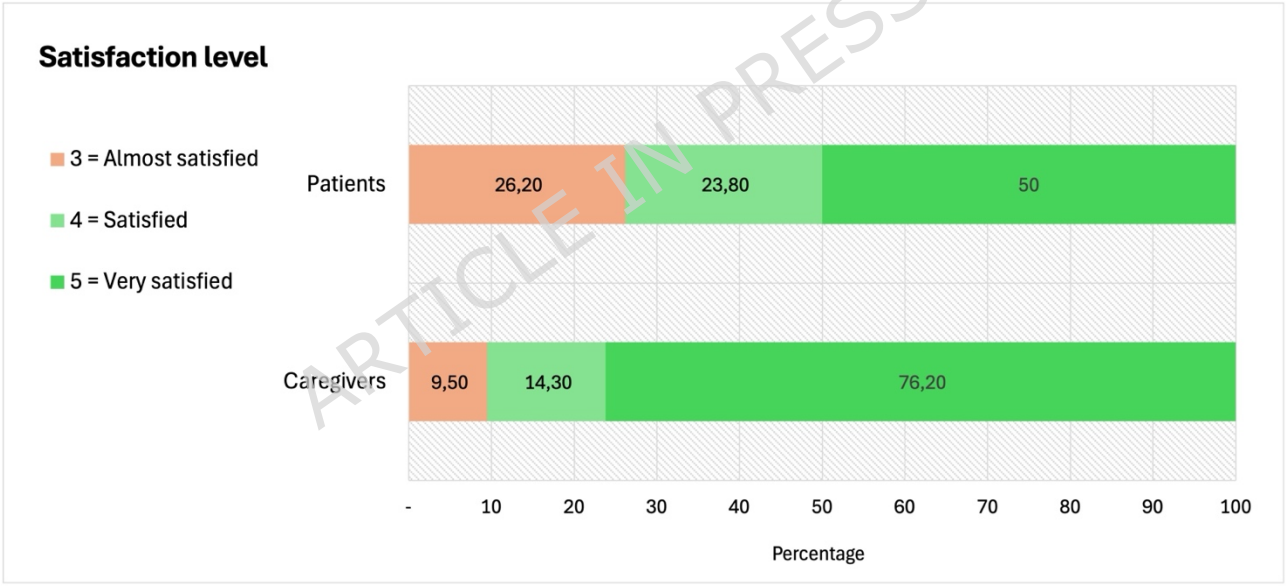
Katz Index score declined from 4 (Q1-Q3: 3–5) to 3 (Q1-Q3: 2–5) ($p = 0.002$). Overall, ADL item-level dependence was prevalent at baseline and remained largely unchanged at follow-up (Supplementary Table 4). Motor performance remained stable, too (TUG 15.5 (13 – 28) seconds at baseline vs 16.3 (12 – 30) at follow-up; $p = 0.505$).

CNS-active medication use increased from 1 (Q1-Q3: 0–1) to 2 (Q1-Q3: 1–2) ($p = 0.008$). Any CNS-active medication change was observed in 20 (47.6%) participants (drug-class changes are detailed in Supplementary Table 5).

Notably, caregiver distress significantly decreased [median NPI distress score: 21 (Q1_Q3: 11–30) to 14 (Q1-Q3: 7–19), $p < 0.001$], and caregiver sense of competence improved [SCQ: 52 (Q1-Q3: 45–62) to 65 (Q1-Q3: 59–68), $p < 0.001$].

Figure 1 shows the use of healthcare services and the proportion of patients remaining at home at the end of the study. No PLwD was institutionalized during the study period. Hospital admissions were rare (2.4%), and only 17% (n = 7) visited the emergency department. Regarding satisfaction (Figure 2), 50% of patients (n = 21) and 76.2% of caregivers (n = 32) rated their experience as the highest possible score (5 out of 5).





Discussion

This study assessed the feasibility of TAP-Continu-A-Mente, a TAP-based intervention delivered to PLwD with BPSD across the hospital-to-home continuum. The intervention was feasible and well accepted. Secondarily, it was

observed to be associated with reductions in NPI scores and increase in caregiver sense of competence. Although functional independence declined modestly and psychotropic medication use increased slightly, motor performance remained stable and healthcare utilization was low, suggesting potential cost-effectiveness.

Hospitalization poses significant risks for older adults, especially with dementia, including hospitalization-associated disability and sarcopenia (32–37). These outcomes are often linked to prolonged immobility, inactivity, and sensory deprivation (38). Nevertheless, hospitals remain common referral points for the management of acutely challenging BPSD in Italy, highlighting the need for testing innovative transitional care models. Many PLwD are brought to emergency departments due to caregiver burnout or an inability to manage behaviors at home, frequently resulting in hospitalization (39,40). Similarly, hospital memory clinics are often points of referral for challenging BPSD, but typically have limited capacity to alter the patient's care pathway, often resulting only in adjustments to pharmacological treatment or hospital admissions. (41,42).

The "Continu-A-Mente" project was developed to address this gap by implementing TAP-Continu-A-Mente, a person-centered transitional care model that integrates TAP across hospital and home environments. The low dropout rate, high satisfaction levels, and absence of institutionalizations support the feasibility, acceptability, and potential clinical relevance of this model. However, since older age and post-discharge logistical constraints may limit participation, implementation will likely require setting- and age-specific adaptations (e.g., flexible scheduling, remote/telehealth options) to maximize

reach and generalizability. Only one participant required hospitalization due to an intercurrent severe acute medical illness and was subsequently referred to a palliative care pathway, further supporting the appropriateness of the intervention in managing dementia care trajectories. Importantly, the high satisfaction level reported by both patients and caregivers highlights the crucial role of innovative care models that ensure continuity between hospital and home settings, which is an underdeveloped aspect in the Italian healthcare system. International studies have shown that continuity of care is closely associated with increased patient and caregiver satisfaction, improved quality of life, and more efficient healthcare utilization (43). However, in Italy, the integration of transitional and community-based services for PLwD remains fragmented and inconsistent (44,45). Continuity of care, achieved through structured handovers and coordinated hospital-to-home activity sessions, likely contributed to the positive outcomes, aligning with international evidence that links rehabilitation continuity to enhanced patient and caregiver satisfaction and quality of life.

From baseline to follow-up, NPI scores measuring BPSD and caregiver distress decreased by approximately 50%. These results suggest clinically meaningful improvements - given that BPSD and caregiver burden are well-documented predictors of institutionalization - although they should be interpreted cautiously given the single-arm feasibility study design. In a large longitudinal study of 2,456 PLwD, over one-third of nursing home placements were attributed to caregiver burden, with BPSD accounting for nearly 16% of cases (42,46). Our findings align with prior evidence on the TAP's benefits in community settings, such as the randomized trials by Gitlin and colleagues,

which demonstrated lowered BPSD, improved functional performance, and decreased caregiver stress, although long-term sustainability of benefits remained uncertain (20,47).

A key element in the success of TAP-Continu-A-Mente might be the improvement in caregiver competence. In our study, the SCQ showed a significant increase in self-perceived competence at follow-up. Caregiver training focused on understanding the cognitive limitations of PLwD and recognizing how misinterpretation of environmental stimuli can trigger distressing behaviors. By equipping caregivers with strategies to engage patients in meaningful, individualized activities, the intervention likely mitigated BPSD through improved caregiver–patient interactions. This supports the hypothesis that some BPSD can be modulated by environmental adaptation and structured activity engagement, rather than relying solely on pharmacological treatment (9,48,49).

The observed decline in functional independence likely reflects the advanced age and frailty of participants, as compared to prior TAP trials with younger cohorts (median age: 65.4 vs 81 years) (21). While TAP may support functional maintenance in earlier stages of dementia, its impact in more advanced stages or older populations may be more limited. Additionally, the modest increase in CNS-active medications likely reflects routine clinical adjustments; however, given that nearly half of completers had medication changes, improvements in NPI may reflect the combined influence of the non-pharmacological program and concurrent medication optimization. Future controlled multicenter studies should disentangle these effects.

This study highlights the importance of care continuity in managing BPSD and suggests that activities tailored to the individual interests and abilities of PLwD may positively influence patient and caregiver well-being. TAP-Continu-A-Mente offers a feasible and potentially scalable model that bridges the gap between hospital and home care, requiring brief training and leveraging existing occupational therapy resources in different settings. Considering the high healthcare costs associated with BPSD, implementing such non-pharmacological interventions may offer a more sustainable alternative for healthcare systems.

Strengths of this study include the use of validated assessment tools, standardized TAP intervention protocol adapted for the transitional care setting, and involvement of both hospital and community healthcare teams. However, several limitations must be acknowledged. The single-center, non-randomized design without a control group limits our ability to draw causal inferences about the intervention's effectiveness. Specifically, as this was a feasibility study with retention as the primary outcome, observed changes in BPSD, caregiver distress, and caregiver sense of competence should be interpreted as signals of potential benefit and cannot establish causality in the absence of a comparator group. Improvements in BPSD should also be interpreted in the context of concurrent routine medication changes, whose timing and indications were not systematically captured. The small sample size and short follow-up period further restrict generalizability and preclude long-term outcome assessment. Moreover, while healthcare service utilization appeared low, it is not possible to determine whether this was directly attributable to the intervention. A controlled multicenter study is needed to

quantify effectiveness and evaluate the sustained impact of the “Continu-A-Mente” model.

Conclusions

The “Continu-A-Mente” project supports the feasibility of a TAP-based hospital-to-home pathway for PLwD with BPSD, and shows encouraging hypothesis-generating signals on patient and caregiver outcomes. These findings warrant evaluation in controlled multicenter studies, with larger samples and longer follow-up, to assess effectiveness and longer-term outcomes.

Declarations

Abbreviations

BPSD: Behavioral and Psychological Symptoms of Dementia

PLwD: People Living with Dementia

TAP: Tailored Activity Program

SSOU: Short Stay Observation Unit

ADLs: Activities of Daily Living

NPI: Neuropsychiatric Inventory

TUG: Timed Up and Go test

SCQ: Sense of Competence Questionnaire

OTs: occupational therapists

CFS: Clinical Frailty Scale

CNS: Central Nervous System

Ethics approval and consent to participate: The study was approved by the Brianza Ethics Committee – Monza on January 12, 2023 (No. 4173). Written informed consent was obtained from all participants and their caregivers prior to enrollment. This study was conducted in accordance with the Declaration of Helsinki.

Consent for publication: Not applicable

Availability of data and materials: Yes. I used or generated research data in this study. The datasets generated and/or analyzed during the current study are not publicly available due to privacy and ethical restrictions but are

available from the corresponding author, Christian Pozzi, upon reasonable request.

Competing interests: The authors declare that they have no competing interests

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Authors' contributions: CP, MCF, AS, SC, GB work conception; CP, LA, LG, SC, GB design of the work; LA methodology supervision; LG, LA, GB search strategy; CP, MCF, CB, CDP, LA, SC, GB analysis and interpretation of data; CP, MCF first draft writing. All authors revised the manuscript, read and approved the final manuscript.

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Table and figure legend

Table 1. Socio-demographic, clinical, and care-related characteristics of people living with dementia (PLwD)

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Supplementary material

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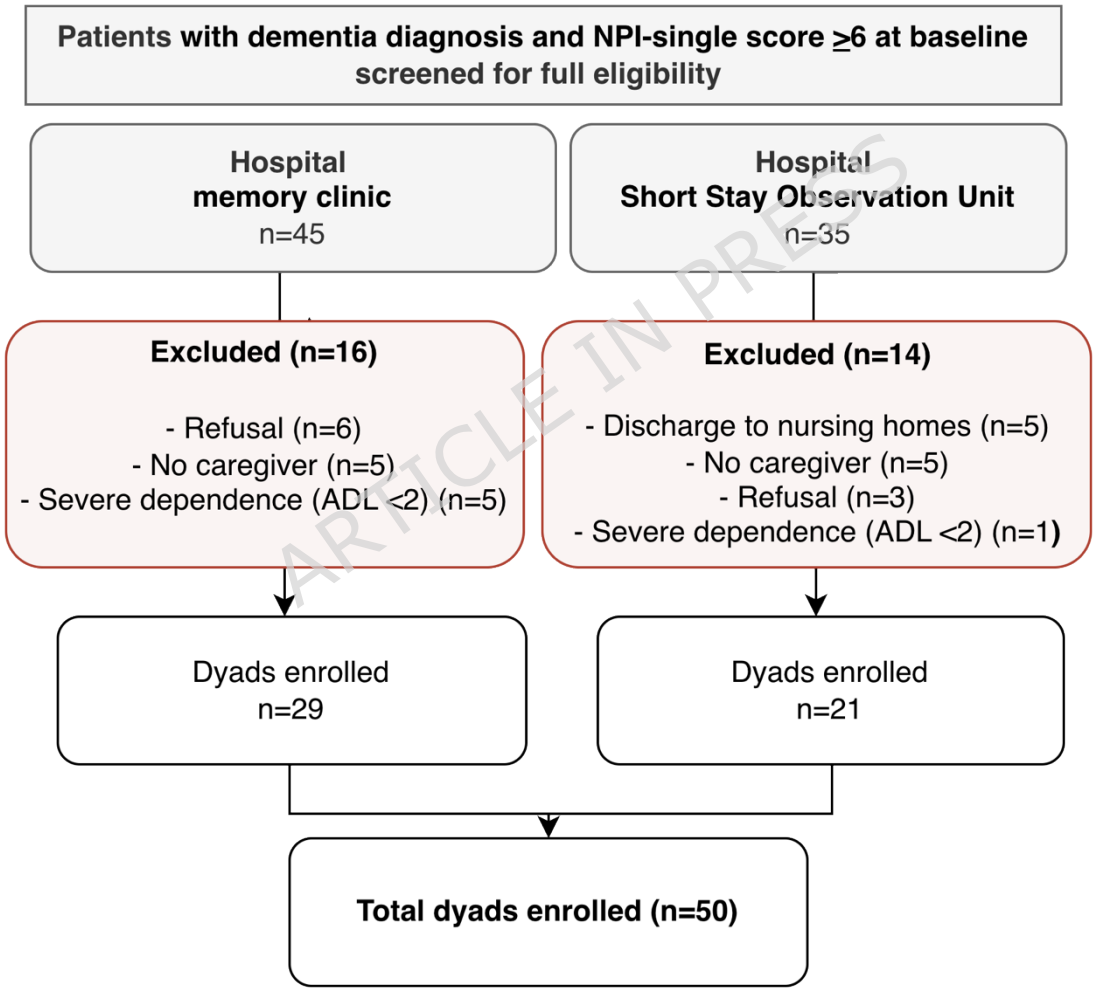
Supplementary Figure 1. Recruitment flowchart by setting



Supplementary Table 1. Baseline characteristic comparison by recruitment setting (N=50)

Baseline variables	Hospital Memory clinic (N=29)	Hospital Short Stay Observation Unit (N=21)	p-value
Age (years)	80 (76–82)	86 (81–87)	<0.001
Sex (female), n (%)	17 (58.6)	9 (42.9)	0.390
Level of education, n (%) *Primary school* *Secondary school* *High school* *University*	 18 (62.1) 4 (13.8) 4 (13.8) 3 (10.3)	 10 (47.6) 4 (19.0) 3 (14.3) 4 (19.0)	0.732
Married, n (%)	21 (72.4)	13 (61.9)	0.543
Level of care at baseline (≥12 hours/day), n (%)	27 (93.1)	21 (100.0)	0.503
CFS	6 (6–7)	6 (6–7)	0.957
Polypharmacy, n (%)	12 (41.4)	11 (52.4)	0.567
NPI at baseline (frequency×severity)	39 (17–53)	47 (29–66)	0.148

NPI at baseline (caregiver distress)	18 (11–29)	26 (18–31)	0.148
TUG (baseline)	14 (13–20)	26 (16–43)	0.005
Katz Index (baseline)	4 (3–5)	3 (2–5)	0.211
N. CNS-active medications (baseline)	2 (0–2)	1 (1–2)	0.441
SCQ (baseline)	52 (45–62)	49 (44–59)	0.680

Legend. Values are shown as n (%) or median (Q1–Q3). P-values are from Mann–Whitney U tests for continuous variables and Fisher's exact tests for categorical variables. CFS= Clinical Frailty Scale; NPI= Neuropsychiatric Inventory; TUG = Timed Up and Go Test; CNS= Central nervous system; SCQ= Sense of Competence Questionnaire.

Supplementary Table 2. Comparison of baseline socio-demographic, clinical, and care-related features between patients who completed the study and those who withdrew

Variables	**Completers (N=42)**	**Dropouts (N=8)**	**p-value**
Age (years)	80 (78 - 86.5)	83.5 (81 - 87.5)	0.002
Sex (female)	18 (42.8%)	8 (100%)	0.009
Recruitment setting *Memory clinic* *Short Stay Observation Unit*	 28 (66.7%) 14 (33.3%)	 1 (13.5%) 7 (86.5%)	0.014
Level of education *Primary school* *Secondary school* *High school*	 26 (61.9%) 6 (14.3%) 5 (11.9%)	 2 (25%) 2 (25%) 2 (25%)	0.288

University	5 (11.9%)	2 (25%)	
Marital status, (%)			0.960
Married	28 (66.7%)	6 (75%)	
Widowed	14 (33.3%)	2 (25%)	
Level of care at baseline, (%)			0.261
≥12 hours/day	31 (73.8%)	8 (100%)	
4-12 hours/day	9 (21.4%)	--	
≤3 hours/day	2 (4.8%)	--	
CFS, median (IQR)	6 (6 – 7)	6 (6 – 7)	0.936
Polypharmacy, n (%)	18 (42.8%)	5 (62.5%)	0.525
N° CNS-active medications, n (%)			0.340
0	14 (33.3%)	2 (25%)	
1	9 (21.4%)	4 (50%)	
2	14 (33.3%)	2 (25%)	
≥3	5 (11.9%)	--	

Legend: Values are reported as n (%) or median (Q1-Q3). CFS: Clinical Frailty Scale; CNS: Central nervous system.

Supplementary Table 3. NPI single-item score ≥6 at baseline vs follow-up (N=42)

NPI item	**Baseline (item score ≥6)** N=42	**Follow-up (item score ≥6)** N=42	**p-value**
Apathy/Indifference	24 (57.1%)	8 (19.0%)	<0.001
Irritability/Lability	23 (54.8%)	12 (28.6%)	0.003
Agitation/Aggression	23 (54.8%)	14 (33.3%)	0.049
Anxiety	15 (35.7%)	6 (14.3%)	0.022
Aberrant motor behavior	15 (35.7%)	6 (14.3%)	0.012
Sleep/Night-time behavior disturbances	14 (33.3%)	5 (11.9%)	0.022

Delusions	13 (31.0%)	7 (16.7%)	0.070
Depression/Dysphoria	13 (31.0%)	10 (23.8%)	0.508
Appetite/Eating disturbances	12 (28.6%)	1 (2.4%)	0.003
Disinhibition	3 (7.1%)	1 (2.4%)	0.625
Hallucinations	1 (2.4%)	3 (7.1%)	0.625
Euphoria/Elation	0 (0.0%)	0 (0.0%)	1.000

Legend. Values are shown as n (%). Threshold ≥6 corresponds to moderate-to-severe symptom in NPI single-item score (frequency×severity). P-values are from the exact McNemar test for paired binary outcomes.

Supplementary Table 4. ADL (Katz Index) item-level dependence at baseline vs follow-up (N=42)

Single-item ADL (dependence)	**Baseline** N=42	**Follow-up** N=42	**p-value**
Bathing	36 (85.7%)	38 (90.5%)	0.625
Dressing	25 (59.5%)	28 (66.7%)	0.549
Toileting	17 (40.5%)	26 (61.9%)	0.035
Transferring	7 (16.7%)	12 (28.6%)	0.180
Continence	4 (9.5%)	13 (31.0%)	0.035

Feeding	0 (0.0%)	4 (9.5%)	0.125

Legend. Values are shown as n (%). P-values are from the exact McNemar test for paired binary outcomes.

Supplementary Table 5. CNS-active medication changes between baseline and follow-up

Variable	**Total N=42**
Any CNS-active medication change (n,%)	20 (47.6%)
Added – any (n,%)	17 (40.5%)

Atypical antipsychotic added	11 (26.2%)
Trazodone added	6 (14.3%)
Antiepileptic added	4 (9.5%)
Antidepressant added	3 (7.1%)
Acetylcholinesterase inhibitor added	3 (7.1%)
NMDA receptor antagonist added	2 (4.8%)
Typical antipsychotic added	1 (2.4%)
Discontinued – any (n,%)	5 (11.9%)
Atypical antipsychotic discontinued	2 (4.8%)
Trazodone discontinued	2 (4.8%)
Antidepressant discontinued	1 (2.4%)
Acetylcholinesterase inhibitor discontinued	1 (2.4%)
NMDA receptor antagonist discontinued	1 (2.4%)
Benzodiazepine discontinued	1 (2.4%)

Legend. Values are reported as n (%). Drug-class rows are not mutually exclusive (a patient may contribute to multiple entries if multiple changes occurred). [Antidepressants: sertraline, duloxetine, citalopram, escitalopram, paroxetine; benzodiazepine: estazolam; typical antipsychotics: haloperidol, promazine; atypical antipsychotics: quetiapine, risperidone; antiepileptics: pregabalin, gabapentin] CNS: Central nervous system.