

Clinical and Organizational Determinants of Wound Management in Home Care Services: A Regional Pilot Study on the Criticalities of ADIs in Campania, Italy

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ABSTRACT

Background: Life expectancy in Italy continues to rise, reaching 83.4 years in 2024, with the over-65 population making up nearly 24.7% of the national demographics. In this aging context, managing chronic diseases is a critical priority, currently impacting 23.5 million citizens. Integrated Home Care (ADI - Assistenza Domiciliare Integrata) serves as a vital model to deliver personalized, multi-professional care directly to fragile patients, aiming to optimize resource allocation, prevent unnecessary hospitalizations, and satisfy territorial healthcare expansion targets outlined by the National Recovery and Resilience Plan (PNRR). Chronic wounds (such as diabetic, vascular, and pressure ulcers) represent one of the most prominent clinical and financial burdens managed within these community settings.

Objectives: This regional pilot study examines the organizational structures and clinical dynamics of 20 ADI units within the Campania Region regarding chronic wound management. Specifically, it explores the statistical associations between dressing manageability, patient adherence, removal-induced tissue trauma, and healing outcomes. Additionally, it investigates how institutional factors, such as dedicated clinical protocols and staff training, affect the quality of community-based wound care.

Materials and Methods: The study utilized an analytical cross-sectional design focusing on 20 selected ADI units within Campania. A structured questionnaire comprising 24 questions across three distinct sections was administered anonymously to nursing coordinators. Data were analyzed using non-parametric statistical tests, specifically Spearman's rank correlation, to identify key service associations.

Results: 60% of the surveyed centers handle between 100 and 500 patients annually. Chronic wounds affect more than half of their active patient population, with 55% of cases involving coexisting multiple injuries. Healing times are highly prolonged (exceeding 6 months for 60% of pressure injuries and 50% of vascular/diabetic ulcers). Spearman's analysis showed a strong positive correlation between dressing manageability and the clinical awareness of removal-induced trauma ($r_s=0.64$, $p<0.01$). Advanced patient age was positively correlated with vascular healing time ($r_s=0.58$, $p<0.01$), indicating slower healing speeds in older patients. Staff training is lagging: only 50% receive periodic clinical training. Hospital-to-territory continuity is primarily maintained through Centralized Territorial Operations Centers (COT) (32%), though 15% still lack a structured interface.

Conclusion: The study demonstrates that regional ADI services manage a considerable volume of highly complex chronic wound cases, emphasizing the need for structured, efficient, and standardized local care strategies. The study outlines three operational pillars: standardizing procurement processes, strengthening Individualized Care Plans (PAI), and enhancing hospital-territory communication via the COT network.

Keywords:

Wound Management, Assistenza Domiciliare Integrata (ADI), Home care, Chronic wounds, Injury.

Introduction

Life expectancy at birth in Italy reached 83.4 years in 2024 (81.4 years for men and 85.5 years for women), placing Italy, alongside Spain, at the top of European demographic longevity. The population of over-65s stands at 14.57 million (24.7% of the

total population), with the over-85 cohort reaching 2.42 million individuals. In this demographic landscape, Integrated Home Care (ADI) has emerged as the cornerstone of a territorial care model designed to provide personalized services to patients with complex care needs through Multidimensional Assessment (VMD).

The ADI framework relies on a multi-professional process that culminates in an Individualized Care Plan (PAI), which establishes objective care targets, recovery timelines, and visit frequencies

via coordinated teamwork involving General Practitioners (GPs), nurses, pharmacists, and specialists. Following the National Recovery and Resilience Plan (PNRR) Mission 6 Component 1 (Investment 1.2.1), institutional targets mandated taking care of at least 10% of the over-65 population by December 2025. National monitoring data from March 2025 indicated that Italy reached 119.2% of this target, taking care of 1,546,443 elderly patients. Managing chronicity, which currently affects 23.5 million people nationwide, represents the primary operational challenge within this expanded home care setting, with chronic wounds representing a significant clinical and financial burden.

Materials and Methods

Study Design and Sample Selection

This study adopted an analytical cross-sectional pilot design to investigate the operational reality of home-based chronic wound care. Due to the preliminary and exploratory nature of the study, a convenience sampling method was used to select twenty (20) distinct ADI units across the Campania Region, Italy. The data collection was specifically structured to gather macro-level organizational characteristics and aggregated clinical trends rather than individual patient records.

Data Collection Tool

A structured questionnaire containing 24 closed-ended questions was developed and administered anonymously to the Nursing Coordinators of each involved ADI unit. Nursing coordinators were selected as target respondents because they possess direct supervision over procurement, clinical staffing, visit logs, and institutional communication interfaces. The questionnaire was split into three main operational sections:

Section 1: Service Capacity and Patient Demographics. Captured annual patient volumes, estimated prevalence of wounds within the active cohort, average age distributions, and predominant metabolic or cardiovascular comorbidities.

Section 2: Clinical Burden and Healing Dynamics. Tracked weekly or monthly home visit frequencies, prevalence of wound typologies, and estimated healing times (categorized as ≤ 1 month, 2–6 months, or >6 months) stratified by lesion type.

Section 3: Wound Management Practices and Organization. Evaluated product procurement criteria (tenders vs. out-of-pocket), availability of anti-decubitus medical devices, regular collaboration with General Practitioners (GPs), presence of localized clinical protocols, continuous training structures, and the utilization of Centralized Territorial Operations Centers (COT) for hospital-territory discharge continuity.

Ethical Considerations

The survey did not collect any individual patient-level data, biological samples, or sensitive personal identifiers. All responses were aggregated at the institutional unit level and treated anonymously, ensuring absolute confidentiality for participating services and professionals.

Statistical Analysis

Data were coded and analyzed using non-parametric statistical methods due to the nominal and ordinal nature of the questionnaire scales and the small pilot sample size ($N=20$). Monotonic relationships between organizational properties, dressing characteristics, and clinical outcomes were analyzed

using Spearman's rank correlation coefficient (ρ or r_s). Two-tailed significance levels were set at $p<0.05$ and $p<0.01$. Statistical evaluations indicate purely associative links and do not infer direct causal pathways.

Results

Descriptive Analysis of Clinical and Organizational Parameters

The descriptive analysis showed that 60% of the surveyed centers handle between 100 and 500 active home care patients annually, while 40% manage a heavy volume exceeding 500 patients. Most units reported that chronic wounds affect more than 50% of their total active patient workload. The age profile of the treated population is significantly skewed toward advanced age, with 70% of centers reporting an average patient age above 70 years, 20% between 50 and 70 years, and only 10% under 50 years (Figure 1-3).

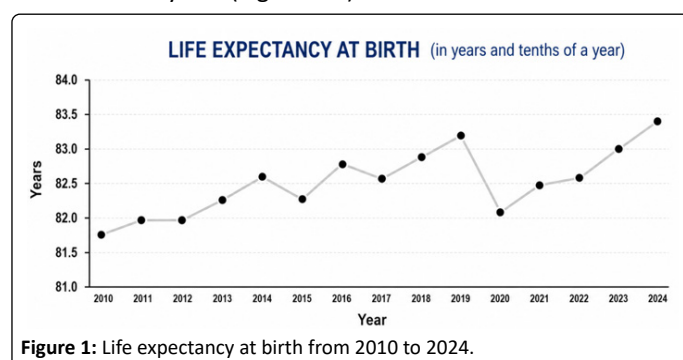


Figure 1: Life expectancy at birth from 2010 to 2024.

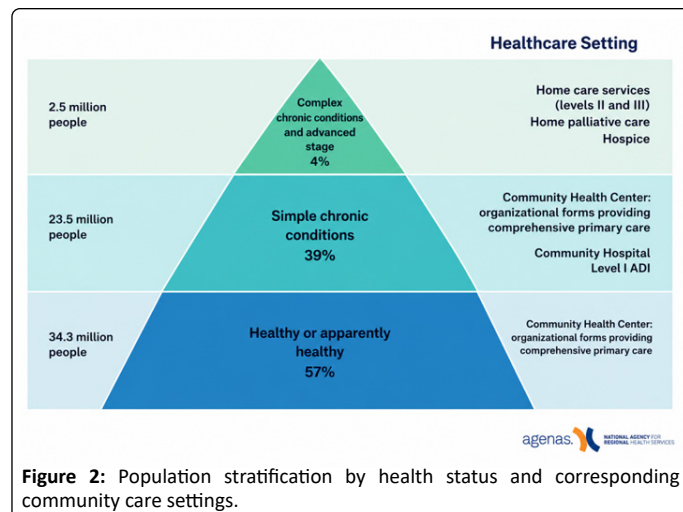


Figure 2: Population stratification by health status and corresponding community care settings.

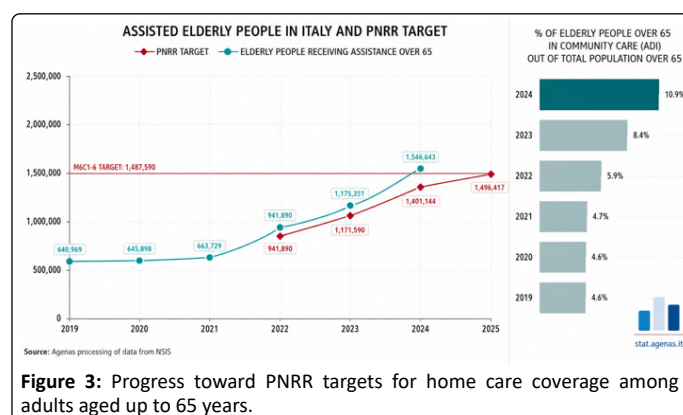


Figure 3: Progress toward PNRR targets for home care coverage among adults aged up to 65 years.

Comorbidities are widespread: Diabetes is present in 85% of the overall patient profiles, followed by hypertension (70%), vascular diseases (65%), and renal failure (40%). In terms of lesion typologies, 55% of the centers primarily treat patients with highly complex, coexisting multiple injuries (combined diabetic, vascular, and pressure ulcers), while 40% report managing isolated pressure injuries (Figure 4).

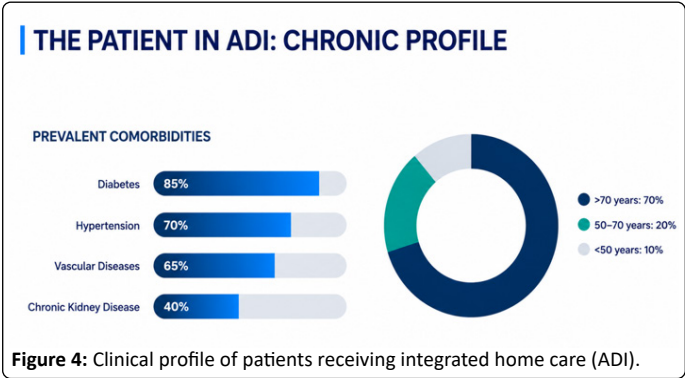


Figure 4: Clinical profile of patients receiving integrated home care (ADI).

Healing timelines are severely prolonged across all wound categories. Specifically, 60% of pressure injuries, 50% of vascular lesions, and 50% of diabetic ulcers require more than 6 months to resolve. Patient adherence to treatment plans was deemed a highly critical operational factor by 95% of the surveyed coordinators. Regarding procurement and material management, 70% of centers heavily prioritize dressing manageability as a core procurement criterion, while a large majority reported that dressing removal-related tissue trauma is a highly severe issue for patients (Figure 5).

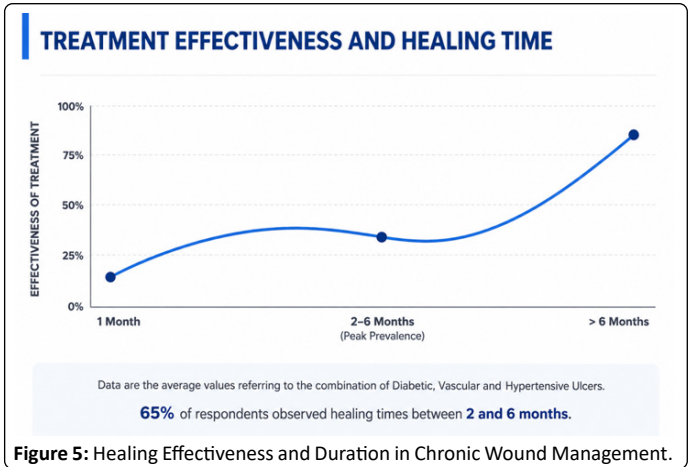


Figure 5: Healing Effectiveness and Duration in Chronic Wound Management.

Organizationally, written protocols for wound care and transfusions are active in 85% of centers, leaving a 15% institutional gap. Staff education shows significant vulnerabilities: only 50% of the ADI units provide structured, periodic clinical training for their nursing staff, while 30% rely exclusively on commercial product information provided by manufacturing companies. Hospital-to-territory continuity is primarily handled via Centralized Territorial Operations Centers (COT) (32%) or directly by nursing coordinators (26%); however, 15% of units currently operate completely without a structured hospital interface.

Statistical Correlation Analysis

To evaluate the interaction between organizational priorities, dressing mechanics, and patient profiles, a Spearman rank

Table 1: Summary of regional wound care service indicators, clinical management practices, and significant correlations identified across territorial care units.

Area of investigation	Identified regional metrics and values	Key statistical associations/insight
Patient volume and capacity	60% of units manage 100–500 patients/year;	Indicates a high, dense organizational work-load across territorial care structures.
	40% manage >500 patients/year.	
Wound typologies	55% Mixed/Combined lesions (Diabetic+Vascular+Pressure);	Highlights extreme clinical complexity requiring multi-professional expertise.
	40% Isolated pressure ulcers.	
Healing durations	>6 Months required for:	Chronicity is prolonged; positively correlated with advanced age ($r_s=0.58$, $p<0.01$).
	• 60% of pressure injuries	
	• 50% of vascular ulcers	
	• 50% of diabetic ulcers	
Patient adherence	95% of ADI units rate patient/family adherence as a critical factor for success.	Highlights that community-based healing relies heavily on caregiver and patient compliance.
Dressing selection criteria	70% prioritize dressing manageability and atraumatic removal mechanics.	Strongly associated with clinical awareness of tissue trauma ($r_s=0.64$, $p<0.01$).
Staff training gaps	50% receive regular clinical updates;	Reveals an institutional vulnerability requiring standardized educational pathways.
	30% rely solely on commercial product briefings.	
Clinical protocols	85% possess written procedures;	A clear operational gap that can lead to clinical practice variations.
	15% operate without standardized protocols.	
Hospital-territory link	32% interface via COT network;	Points to fragmentation in discharge continuity for 15% of regional entries.
	26% via Nurse coordinators;	
	15% have no structured interface.	

Discussion

The operational data compiled across these 20 regional units underscore the heavy clinical and organizational demands placed upon community-based home care networks. The fact that 40% of the units manage more than 500 complex patients annually highlights the central role ADI services play in shifting care away from traditional hospital environments, directly matching the strategic infrastructure goals of Italy's PNRR Mission 6. However, the high prevalence of complex, multi-injury scenarios (55%) coupled with extended healing times exceeding 6 months reveals that the local clinical workload is intensely challenging.

The statistical correlation between dressing manageability and removal trauma ($r_s=0.64$, $p<0.01$) highlights a crucial clinical insight: nursing coordinators are highly aware that advanced dressings must not only be clinically effective but also physically manageable and easy to remove. Products that cause mechanical tissue stripping upon removal tear newly formed granulation tissue, cause unnecessary pain, and disrupt patient trust, directly hurting overall treatment adherence (which 95% of services consider critical).

The age-related correlations require careful interpretation. The positive correlation between age and vascular healing times ($r_s=0.58$, $p<0.01$) clearly indicates that physiological senescent changes, localized microvascular decline, and multiple coexisting diseases significantly lower healing speeds in older individuals. Concurrently, the negative correlation between age and the perceived relevance of removal trauma ($r_s=-0.49$, $p<0.05$) indicates that older cohorts may underreport or have reduced sensory perception of procedural pain. This highlights an important clinical recommendation: clinicians must systematically use objective, structured skin-assessment tools in older populations rather than relying solely on spontaneous patient feedback, as sensory deficits could mask ongoing mechanical tissue damage.

Finally, the study highlights critical structural gaps. The fact that 30% of centers depend entirely on commercial product briefings for training, combined with a 15% complete absence of clinical protocols and a 15% lack of hospital-territory communication networks, underscores significant institutional fragmentation. This fragmentation threatens the long-term clinical and economic sustainability of home care services.

Conclusion and Three Operational Pillars

This regional pilot study demonstrates that ADI services manage a large volume of complex chronic wound cases, emphasizing the urgent need for structured, efficient, and standardized local care strategies. To ensure long-term economic sustainability, eliminate fragmentation, and optimize patient care pathways, the study establishes three fundamental operational pillars:

- 1. Standardizing Device Procurement:** Standardize the purchasing processes for advanced medical devices and dressings, prioritizing competitive, high-quality public tenders to ensure economic sustainability without compromising clinical efficacy or material manageability.
- 2. Strengthening the PAI Framework:** Formally reinforce the Individualized Care Plan (PAI) as a mandatory tool for

mapping out precise, multi-professional recovery timelines, allocating specialized home visits, and tracking objective clinical outcomes.

- 3. Optimizing Care Continuity via COT:** Bridge hospital-territory communication gaps by expanding the Centralized Territorial Operations Center (COT) network, eliminating the 15% isolation gap, and ensuring seamless, protected patient transitions from hospital wards to home care settings.

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None.

Conflict of Interests

The authors declare no conflict of interest.

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