

EMPIRICAL RESEARCH QUANTITATIVE

Home Care Organisational Models in Italy: A Cross-Sectional Study of Cluster Analysis and Stakeholder Perceptions

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ABSTRACT

Aim: To classify Italian home care models based on structural characteristics, process factors and stakeholder perceptions.

Design: This is a secondary analysis of the AIDOMUS-IT multicentre cross-sectional study, conducted in Italy between July 2022 and December 2023.

Methods: Data were collected via online surveys completed by 33 Local Health Authority Nursing Directors, home care nurses and patients. Hierarchical cluster analysis was used to classify different organisational models based on structural and process-related factors. Nurses' and patients' perceptions of care were described for each identified cluster.

Results: The analysis identified three distinct organisational home care models: The 'multidisciplinary model', in which nurses reported high dissatisfaction due to organisational complexity and excessive workloads. In the 'nurse-centred model', characterised by publicly employed nurses, strong leadership, and a supportive work environment, patients reported high levels of satisfaction. The 'performance-based model', which operated with a lower nurse-to-patient ratio, reduced service hours, and greater reliance on external professionals. Nurses in this model reported high job satisfaction but also a greater intention to leave, while patient satisfaction was lower.

Conclusions: This study underscores the importance of leadership, resource management, and a supportive work environment in influencing both job satisfaction and patient outcomes in home care settings.

Implications for the Profession and/or Patients Care: Policymakers could use these findings to refine care models and improve service delivery.

Impact: Limited research has examined the organisational structures of home care services, which are important for professionals' organisational well-being, patient safety, and quality of care. This study identified three distinct organisational home care models that could be used to refine care approaches and improve service delivery.

Reporting Method: This study respects the EQUATOR guideline for observational studies (STROBE).

Patient or Public Contribution: This study did not include patient or public involvement in its design, conduct, or reporting.

1 | Introduction

Home care has emerged as a vital component of modern healthcare systems, responding to the growing need for personalised care for patients with chronic conditions, disabilities, or vulnerabilities (Gaillard and Russinoff 2023; Lizano-Díez et al. 2022). According to the World Health Organization (WHO), home care services play a vital role in ensuring continuity of care, reducing avoidable hospital admissions, and enhancing the quality of life for patients and their families (World Health Organization and Regional Office for the Eastern Mediterranean 2015). One of the major challenges in home care is identifying effective organisational care models that can deliver the best patient care (Van Eenoo et al. 2018). A care model is a comprehensive concept that outlines the structure of health service delivery and related processes (Davidson et al. 2006). It serves as a guide for how healthcare is organised, coordinated, and delivered. The most successful care models aim to improve the quality, efficiency, and accessibility of services while ensuring long-term sustainability.

2 | Background

An organisational care model in home care is essential for managing resources efficiently, delivering high-quality personalised care, and ensuring seamless coordination among healthcare professionals (Bienkowska-Gibbs et al. 2015; Landers et al. 2016). Furthermore, effective care models enhance job satisfaction of healthcare workers by managing workloads and allowing flexibility to adapt to varying patient needs (Cantarelli et al. 2023; Johnson et al. 2023; Marcomini et al. 2025). Donabedian's model for evaluating healthcare quality provides a useful framework for understanding the connection between the structural characteristics of a healthcare service, the care processes, and the resulting outcomes (Donabedian 1988). Structural characteristics refer to the physical and organisational aspects of the care environment, human resources, and organisational factors, including quality monitoring systems. Care processes encompass the actions taken during care delivery by both healthcare professionals and patients. The effectiveness of structural characteristics plays a critical role in care processes by providing essential resources. Improved care processes lead to better outcomes, such as enhanced patient health and satisfaction. These outcomes, in turn, can inform enhancements in resources, training, and organisational structure.

In the professional context of home care, nurses play a vital role by coordinating care, delivering clinical interventions, monitoring patients' conditions, and supporting families in managing complex needs (Santomauro et al. 2024). As the population ages

and the prevalence of chronic conditions and frailty increases, the nursing role is expected to evolve, requiring greater autonomy and advanced competencies. Additionally, nurses will have a more significant involvement in multidisciplinary care networks (Kiljunen et al. 2019). This shift highlights the need for strong organisational care models that can effectively support these expanded responsibilities.

To the best of our knowledge, only one study examined the differences between home care models across Europe (Van Eenoo et al. 2018). Six home care models were identified through a cluster analysis. These models differ in three key areas: patient-centred care delivery, availability of specialised personnel, and monitoring of care performance. The care models revealed in this study did not differ significantly in terms of integration and coordination across different care environments, services, and healthcare personnel, nor did they reflect the extent of technology support. However, an additional exploration of stakeholders' perspective within identified clusters has not been performed yet in the literature.

Home care in Italy is culturally perceived as an essential, though complementary, part of the healthcare system, particularly for elderly people with chronic conditions, individuals with disabilities, and patients with high levels of frailty (Bagnasco et al. 2023). Informal caregivers play a crucial role in providing daily support; however, the complexity of care in the home setting often imposes a substantial burden on them, as they may lack adequate training, resources, and psychological support (Cioffi et al. 2023). For this reason, caregivers frequently require additional assistance from formal services to handle medical procedures, coordinate with healthcare professionals, and maintain continuity of care.

From an institutional perspective, home care in Italy is regulated by both national and regional laws, which has resulted in significant variation in its organization across geographic areas. This variability has produced considerable heterogeneity in the organisational care models adopted by local health authorities (LHAs) (Gori 2012). Despite the crucial role of home care in the Italian healthcare system, the existing literature still lacks systematic analyses of these models and their implications for patients, caregivers, and healthcare professionals.

Thus, this study aimed to identify clusters of organisational care models in Italian home care by classifying Local Health Authority (LHA) services according to their structural characteristics and process factors. The analysis of organisational home care models in Italy may have significant implications for healthcare governance, fostering the adoption of more effective and sustainable models. Additionally, this study could

What Does This Paper Contribute to the Wider Global Clinical Community?

- Three different organisational models were identified in home care settings.
- Performance-based organisational models result in lower patient satisfaction.
- In home care settings, effective leadership can lead to job satisfaction for nurses.

assist healthcare organisations in restructuring services and promoting standardised tools for evaluating care, contributing to greater equity and integration in home care services.

3 | Methods

3.1 | Study Design

The AIDOMUS-IT study, a multicentre cross-sectional study, was conducted in Italy between July 2022 and December 2023 (Bagnasco et al. 2023) to provide a clear picture of features, strengths, weaknesses and outcomes of home care. The primary aim of the AIDOMUS-IT study was to provide a comprehensive national overview of home care in Italy by examining: (a) the structural and organisational characteristics of home care services, (b) the features of nurses' work environments, and (c) patients' perceptions of satisfaction with the care received. The study adopted a cross-sectional survey design, collecting data from Local Health Authorities (LHAs), nurses, patients, and informal caregivers to identify strengths, weaknesses, and outcomes of home care delivery.

Building on this foundation, this secondary analysis was conducted to identify clusters of organisational care models and their impact on nurses' and patients' perception, and its reporting as performed according to the STROBE guidelines (von Elm et al. 2008). This clustering approach extends the original study by linking organisational patterns with stakeholders' perceptions, thereby generating novel insights beyond those of the primary analysis.

3.2 | Study Setting and Sampling

Italy has a national, tax-funded public healthcare system that includes community and home care services. The country is divided into 20 regions, each responsible for managing healthcare services within its territory with a degree of autonomy. This aims at ensuring that care aligns with national legislation while being tailored to regional needs. Healthcare services are provided through various types of facilities, including LHA, Hospital Trusts (HT), and Scientific Institutes for Research Hospitalisation and Healthcare (IRCCS) (Italian Ministry of Health 2015). HTs and IRCCSs provide only inpatient and outpatient care in their facilities, while LHAs manage both hospital services through affiliated hospitals and community or home care. Community and home care services are delivered through facilities managed by LHAs, such as Districts, Community Hospitals, and, more recently, Community Health Centres, which are currently being

implemented (Italian Government 2020; Italian Ministry of Health 1992; Italian Ministry of Health 2015, 2022). Other providers of community care include residential and semi-residential facilities, which may be managed by private institutions, LHAs, municipalities, or regional authorities. However, these facilities do not provide home care services. Private healthcare facilities often complement the public healthcare system, and some operate under public agreements, receiving reimbursement from LHAs for certain services. However, private facilities are not permitted to provide home care services. Therefore, only LHAs provide and manage home care services in Italy. Nationally, home care services are generally not organised on a 24/7 basis; rather, each LHA independently decides its weekly opening days and daily operating hours, leading to considerable variability in service accessibility and delivery. Not only the organization of service hours but also the composition of professional teams varies according to the decisions of each LHA. Teams may include nurses with different educational backgrounds, professionals from various disciplines, and, in some cases, nursing assistants who provide support with basic care under the supervision of registered nurses.

All Italian LHAs were invited to participate in the AIDOMUS-IT study from the 'National Federation of Orders for Nursing Professions', that is, the Italian Regulatory Board of Nursing, and those that agreed to participate were asked to indicate a facilitator to manage and supervise local data collection.

3.3 | Data Collection

Data was collected from Nursing Directors of each LHA, nurses employed in this service and currently providing direct care at patients' homes, and patients. No further inclusion or exclusion criteria were considered, except for the provision of written informed consent by the participants. Data collection was performed in Italian through three online questionnaires developed using LimeSurvey. Each LHA was assigned a unique alphanumeric code, which participants entered when completing their questionnaire. This ensured the anonymity of data collection while assigning a random ID to each record in LimeSurvey.

The directors' survey aimed at providing an overview of services delivered directly or outsourced by LHAs, by including questions regarding key characteristics of the organization, such as catchment area, territory type, population density, and services provided. The nurses' survey aimed at providing an overview of nurses' sociodemographic, educational, and job-related characteristics, other than their perception of key indicators, such as nursing staff characteristics, work shifts, work environment, missed care and job satisfaction. Both multi-item and single-item scales were used in the survey. The choice to use single items was made to reduce participant burden and promote greater response completeness (Tavani et al. 2019; Nagy 2002), as it has been shown that single items can achieve adequate levels of validity and reliability even for global constructs (Fakunmoju 2020; Nakata et al. 2013; Dolbier et al. 2005). Finally, the patients' survey aimed at collecting patients' experience and perception of the service, and it included the Home Health Care Survey of the

3.4 | Variables

To select variables to be included in the cluster analysis for models profiling, the authors performed a series of meetings and finally agreed to include several structural, process factors, and outcomes, extracted from surveys according to Donabedian's model (Table 1).

Specifically, to pursue the secondary aim of the study, considered variables were included in the surveys carried out on nurses and patients. Included variables were:

- nurses' job satisfaction, which was measured through a single item, that is, 'How satisfied are you with your current job?'. Nurses answered according to a four-levels Likert scale ranging from 'very satisfied' to 'very unsatisfied' (McHugh et al. 2011).
- nurses' intention to leave their job, which was measured through a single item, that is, 'If you could, would you leave your job in the LHA within the next year due to your dissatisfaction at work?'. Nurses answered yes or no.
- nurses' perception of psychosocial conditions in the workplace, which was measured using the Italian version of the Copenhagen Psychosocial Questionnaire version III (COPSOQ III) (Peter et al. 2022). Out of the 29 items included in COPSOQ III, 16 items were selected and included in this study, considering the characteristics of the home care setting (Bagnasco et al. 2024). The items were selected by a panel of experts with advanced knowledge in nursing field and composing part of the authorship. Then, a group of six nurses with large experience in home care were asked to assess the relevancy of each item selected for the purposes of this study, based on a Likert scale from 1 (completely irrelevant) to 4 (completely relevant). Responses were dichotomised as 0 (responses 1–2) and 1 (responses 3–4) and the content validity index was calculated, confirming the content validity of all selected items (item content validity > 0.80). For the purposes of the analysis presented in this manuscript four dimensions of the scale were considered, namely, Quality of leadership (QOL, 2 items, Cronbach's $\alpha=0.81$), Work-private life conflict (WPC, 2 items, Cronbach's $\alpha=0.88$), Burnout symptoms (BS, 2 items, Cronbach's $\alpha=0.87$), and possibility for Career development (PFD, 2 items, Cronbach's $\alpha=0.79$). Nurses were asked to answer according to a five-levels Likert scale ranging from 0 (never/not at all) to 4 (always/very much). Higher scores indicate a stronger perception of each investigated dimension. Nurses' answers were transformed in a score ranging from 0 (never or not at all) and 100 (always or very much).
- nurses' perception of the work environment, which was measured using the Italian version of the Practice Environment Scale of the Nursing Work Index (PES-NWI) (Zanini et al. 2022). Out of the 32 items included in the PES-NWI, nine were considered suitable for the home care setting and included in this study, resembling

the dimensions 'Staffing and resource adequacy' (PES Adequacy, 4 items, Cronbach's $\alpha=0.91$) and 'Nurse manager ability, leadership and support of nurses' (PES Manager, 5 items, Cronbach's $\alpha=0.88$). Nurses provided answers according to a four-levels Likert scale ranging from 1 (totally disagree) to 4 (totally agree). After calculating the mean score for each dimension, nurses were categorised into two groups according to the scale's cutoff value (2.5). A score greater than 2.5 was considered adequate, indicating a more positive perception of the working environment.

- nurses' attitudes towards patients' safety, which was measured using the Italian version of the Safety Attitude Questionnaire (SAQ) (Nguyen et al. 2015). Out of the 36 items included in the SAQ, 12 were included in this study, assessing the dimensions 'Team working climate' (TWC, 6 items, Cronbach's $\alpha=0.88$) and 'Safety of the working climate' (SWC, 6 items, Cronbach's $\alpha=0.86$). Responses were collected using a five-level Likert scale, ranging from 1 (totally disagree) to 5 (agree). For each dimension, the percentage of answers provided as 4 or 5 were computed for the final score, with higher percentages indicating a more positive attitude towards patient safety.
- nurses' perception of the workload, which was measured using the Italian version of the NASA-TLX Home Care Nurses (NASA-TLX_HC-IT) (Zaghini et al. 2024). This tool includes six items, while the validation in Italian conducted in the home care setting includes five items. These items investigate nurses' workload regarding emotional demand, mental demand, physical demand, temporal demand, emotional demand, and frustration. Nurses had to indicate their perception of the workload in each area through a 20-level Likert scale ranging from 1 (low) to 20 (high). The final score was calculated by standardising from 0 to 100 the score obtained by summing all the items; higher scores indicate a higher perception of the workload. NASA-TLX_HC-IT showed adequate internal consistency reliability (McDonald's Omega=0.74).
- nurses' perception of missed care, which was measured using the 'Missed Nursing Care in Home Care' (MNC_HC), that was developed and validated within the AIDOMUS-IT study (Di Nitto et al. 2024). The nine items included in this scale assess how often nurses fail to perform care activities due to time constraints in the last week. Activities were selected according to the literature and main features of home care, that is, Technical Nursing; Basic nursing/personal hygiene; Health education; Collaboration with other healthcare professionals to provide support to families; Provide support to carers; Disease prevention; Health promotion; Bureaucracy; and Communication and relationship. Nurses provided answers according to a 4-levels Likert scale ranging from 0 (never) to 3 (often). Responses were dichotomized, with ratings from 1 (hardly ever) to 3 (often) recoded as 1, indicating the presence of missed care, while a rating of 0 (never) indicated its absence. The final score was calculated by summing the items where nurses reported missed care (range: 0–9), with higher scores reflecting a greater occurrence of missed nursing care. The tool showed high internal consistency, with a Cronbach's alpha of 0.92.

TABLE 1 | Selected variables.

Structural factor
Total number of nurses/population over 65 + 1000 inhabitants ^a
% of nurses employed by the LHA ^b
% of nurses who working for cooperatives or agencies
% of freelance nurses ^b
Average age of nurses ^b
% of nurses with a university education ^b
% of nurses who have attended a postgraduate course in home nursing ^b
% of nurses with at least 10 years of experience in home care ^b
% of LHAs with presence of physiotherapists in the team ^b
% of LHAs with presence of nursing aids in the team ^b
Total number of professionals in the team (out of 5 maximum, average) ^b
% of nurses who take at least 30 min to reach patients' homes ^b
% of nurses who travel at least 30 km to reach patients' homes ^b
Number of weekly opening days (average) ^a
Daily average opening hours ^a
Process factor
Days between the assessment visit and patient take in charge (average) ^a
Days between patient take in charge and access to treatment according to the integrated care plane (average) ^a
% of LHAs with waiting time ≥ 4 days between take in charge and access to treatment ^a
% of LHAs with presence of first-level Home Care Services ^a
% of LHAs with presence of second-level Home Care Services ^a
% of LHAs with presence of third-level Home Care Services ^a
% of LHAs with presence of Mental Health Service ^a
% of LHAs with presence of Disability Service ^a
% of LHAs with presence of Chronic Conditions Service ^a
% of LHAs with presence of Telemedicine or Teleradiology Services ^a
% of LHAs with presence of Telenursing Services ^a
% of LHAs with presence of Family and Community Nurses Services ^a
% of LHAs with presence of Specialised Nursing Consultations Services ^a
% of services provided (out of a maximum of 12) ^a
% of nurses who usually work overtime ^a
% of activities related to care plan management carried out by nurses (out of a maximum of 5) ^a
% of specialised activities out of a maximum of 3 (PICCs insertion, blood transfusions, ECG) ^a
% of nurses who primarily focus health education ^a
% of nurses who primarily focus advanced wound care ^a
% of nurses who primarily focus on basic wound care ^a
% of nurses who primarily focus monitoring and measurements ^a

(Continues)

TABLE 1 | (Continued)

Process factor			
% of nurses who primarily focus care plans, planning, evaluation ^a			
% of nurses who primarily focus clinical and care procedures ^a			
Outcomes	Conceptual meaning	operationalization	Instrument & Psychometrics
Job satisfaction ^b	Overall affective evaluation of nurses regarding their work experience and professional role	Measured through a single global item ('How satisfied are you with your current job?') rated on a 4-point Likert scale (very satisfied–very unsatisfied). Scores dichotomized into satisfied vs. not satisfied	Single-item job satisfaction scales have shown acceptable reliability and validity in nursing research
Intention to leave ^b	Tendency to consider leaving the current job due to dissatisfaction	Single dichotomous item ('If you could, would you leave your job in the LHA within the next year due to dissatisfaction?')	Widely used in workforce studies; demonstrated predictive validity for turnover
Psychosocial contidion in the workplace ^b	Nurses' perception of psychosocial risks and resources in the work environment	Measured using selected 16 items from COPSOQ III; 0–4 Likert scale; score transformed to 0–100; four domains used: Quality of Leadership, Work–Private Life Conflict, Burnout Symptoms, Career Development	Italian COPSOQ III validated; dimensions used showed good reliability: $\alpha = 0.81$ – 0.88 ; content validity confirmed (ICV > 0.80)
Perception of the work environment ^b	Suitability of organisational support, leadership, staffing, and resources	9 items from Italian PES-NWI; 4-point Likert scale; mean score calculated; categorised using 2.5 cut-off	Excellent reliability: $\alpha = 0.88$ – 0.91 ; validated in Italian nursing settings
Patient safety ^b	Nurses' perception of teamwork safety climate and safety culture	12 items from SAQ; 5-point Likert scale; final score computed as % of positive responses (≥ 4)	Strong reliability: $\alpha = 0.86$ – 0.88 ; validated Italian version
Workload ^b	Perceived physical, emotional, cognitive and temporal demand of nursing activities	NASA-TLX_HC-IT, 5 items; 20-point Likert scale; total score standardised 0–100; higher = higher workload	Good internal consistency (Omega = 0.74); validated in home care
Missed care ^b	Care activities left undone due to lack of time or resources	9-item MNC-HC; Likert 0–3; dichotomized; sum score 0–9	Excellent reliability $\alpha = 0.92$; validated in AIDOMUS-IT
Patient satisfaction ^c	Patients' perception of received home care, communication and care processes	HHCAHPS Italian version; 34 items; composite measures + global ratings; Likert and numerical responses; higher scores = better experience	Validated Italian tool; CFA confirmed structure; Omega 0.60–0.81; good convergent validity

^aData from directors' survey.^bData from nurses' survey.^cData from patients' survey.

– patients' experience of home care, which was measured using the HHCAHPS tool. This tool, originally developed by the Centers for Medicare and Medicaid Services (CMS 2019) in collaboration with the Agency for Healthcare Research and Quality (AHRQ), was adapted and validated in Italy within the AIDOMUS-IT study (Iovino et al. 2025). The instrument consists of 34 items, organised into three composite measures: care of patients (4 items), communication with providers (6 items), and specific care issues (7 items) together with two global rating items. Responses are collected through dichotomous, Likert-type, or numeric rating scales, depending on the item. Higher scores indicate a more positive perception of

care. Psychometric testing confirmed satisfactory structural validity through confirmatory factor analysis, with item loadings consistent with the hypothesised three-factor structure. Internal consistency was acceptable, with Omega coefficients ranging from 0.60 to 0.81 across the factors, and convergent validity was supported by significant correlations with patients' global satisfaction.

3.5 | Data Analysis

Given the completeness and quality of the data collected from the survey administered to healthcare directors, a subset of

the 77 Local Health Authorities (LHAs) participating in the AIDOMUS-IT study was selected for the cluster analysis. This subset was determined through a preliminary assessment that identified six regions—Liguria, Veneto, Emilia-Romagna, Toscana, Lazio and Sardegna—as demonstrating particularly high data quality. This assessment was based on three main criteria: a low proportion of missing values across variables, internal consistency of the reported information, and successful validation through a post hoc follow-up telephone survey. Ultimately, data from 33 out of the 38 LHAs in these six regions were included in the analysis. Five LHAs were excluded because their nursing staff did not participate in the second phase of the survey targeting nurses.

To achieve the primary aim of this study, survey data from both directors and nurses were analysed. A hierarchical agglomerative cluster analysis was then performed on this dataset, employing Euclidean distance as the dissimilarity metric between statistical units and the Ward method to assess similarity between units. This statistical approach aimed to group the LHAs into homogeneous clusters based on their characteristics. The Ward method, which minimises within-cluster variance at each aggregation step, ensures that the data is partitioned into homogeneous groups. A graphical representation of the clustering process, using a dendrogram, helped identify the optimal number of clusters, assessed through the Semipartial R-Squared index.

For the secondary aim of this study, data from surveys conducted with nurses and patients within the identified clusters were summarised and descriptively compared. All analyses were implemented using SAS 9.4.

For each cluster, all variables were descriptively summarised using frequencies or means, and a graphical representation of variables was performed by plotting the ratio between the cluster average and the general average. Differences across clusters were explored using ANOVA followed by Tukey's post hoc test.

3.6 | Ethical Consideration and Informed Consent

This study protocol was approved by the Liguria Regional Ethics Committee in November 2022 (Ref. number 675/2022—DB id 12844). Participation was voluntary and informed consent was obtained prior to questionnaire completion through the LimeSurvey platform. Before consenting, all participants needed to see an information sheet explaining the study aims, procedures, potential risks and benefits, confidentiality safeguards, and their right to withdraw at any time without consequences. Data collected for this study were anonymised: each record was assigned a unique numeric code provided directly by LimeSurvey platform when the questionnaire was completed. No direct identifying information was collected. Data are stored in a protected database in accordance with the General Data Protection Regulation (EU Regulation 2016/679—GDPR 2016). The study adheres to the ethical principles of the Declaration of Helsinki (World Medical Association 2013) and relevant European (Council for International Organizations of Medical Sciences 2016) and national regulations on research ethics and data protection (Legislative Decree No. 196/2003, as amended by Legislative Decree No. 101/2018).

4 | Results

4.1 | Cluster Analysis

For the cluster analysis, data from 33 LHAs were considered. Regarding the resident population aged 65 and older, these 33 LHAs represent 41.2% of the elderly population in the 77 LHAs that participated in the AIDOMUS-IT study and 33.1% of the total elderly population. Cluster analysis and the observation of the dendrogram (Figure 1) identified three groups, consisting of 14, 8, and 11 LHAs, respectively. This choice is further supported by the pseudo t-square test, which shows a significant drop in its value at the third cluster, confirming that a partition into three groups provides the most stable and representative structure for the data (Figure 2).

The characteristics of clusters for all variables are reported in Table 2, while Figure 3 plots, for each cluster, the ratio between the cluster average and the general average for variables that mainly featured the cluster. The description of the features of each cluster allows us to identify the main features of each model, although clusters may not be statistically different for all variables. The following description includes both the highlights of the main features of each cluster and a comparison across them.

Cluster 1 is characterised by a home care and patient management model based on a multidisciplinary team, which also includes external resources (cooperatives, temporary employment agencies, freelance professionals) and carries out innovative activities. In this group, although the proportion of nurses directly employed by the LHA is high (88.7%), a percentage of 8.3% is employed by cooperatives or temporary employment agencies or operate freelance (3.0%). This composition was statistically similar to Cluster 2 and widely different to Cluster 3. Additionally, the care team more frequently includes physiotherapists and support staff (86.0% of LHAs on average), although differences with other clusters were not statistically significant ($p=0.15$). Home care services are active almost every day of the week (mean=6.7), with an average of 11.6 operating hours per day, with a similar

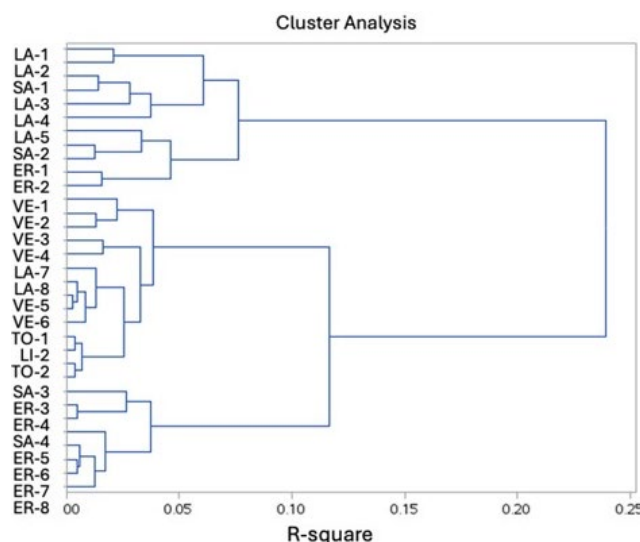


FIGURE 1 | Dendrogram derived from the cluster analysis.

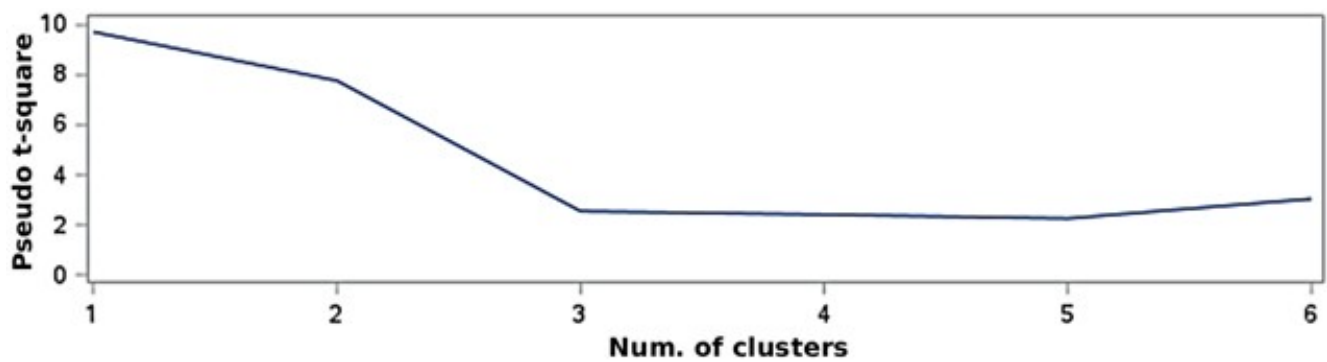


FIGURE 2 | Criterion for the number of clusters.

figure in cluster 2 ($p=0.77$ and $p=0.77$ for opening days and hours, respectively) and significantly lower weekly opening days (mean = 6.0, $p=0.04$) and daily working hours (mean = 9.0, $p=0.09$) in cluster 3. Waiting times for take in charge and access to treatment do not differ significantly from the other clusters but are slightly higher than in other groups (mean = 2.7 and 3.6 days, respectively). Notably, in half of the LHAs (50.0%) included in this cluster, the waiting time exceeds 4 days from the activation of the home care service to the first intervention delivered to the patient, although not statistically significant differences were detected with Cluster 2 and 3 (25.0% and 36.0%, respectively; $p=0.52$). The LHAs in this group offer a wider range of activities compared to the other clusters (69.0% out of the 12 identified; $p=0.04$), including innovative solutions such as telemedicine and teleradiology, which were available in 85.7% of LHAs included in this cluster compared to 50.0% and 54.5% in Cluster 2 and 3, respectively ($p=0.14$). Moreover, this cluster is featured by a higher availability of family and community nurses (92.0% of LHAs), which is similar to cluster 2 (75.0%; $p=0.56$), and very different to cluster 3 (27.3%; $p<0.001$). Finally, this group also stands out for the provision of specialised services, such as the placement and management of PICCs (Peripherally Inserted Central Catheters), blood transfusions, and EKGs (85.7% of LHAs compared to 50.0% and 57.6% in cluster 2 and 3, respectively; $p=0.001$), as well as for including nurses who primarily focus on health education (54.7% of LHAs), similarly to Cluster 2 (61.1%; $p=0.99$) and differently from Cluster 3 (43.9%; $p=0.012$).

Cluster 2 is characterised by a patient care model that can be defined as ‘nurse-centred’. Nurses in this group are the key players in their work activities, that is, almost all of them are employed by the LHA and, in addition to performing their clinical duties, also take on managerial activities related to the patients’ care plan. Specifically, 95.2% of the nurses in this cluster have a public employment contract with the LHA, 36.9% have at least 10 years of experience in home care services, and only 17.8% have attended a home care training course, which is a percentage lower than the total average (22.1%), although not statistically different from the other clusters ($p=0.132$). The LHAs in this group have a higher nurse-to-elderly population ratio than the average (8.6 per 1000 residents aged over 65, compared to the general sample average of 7.1), although differences across clusters were not statistically significant ($p=0.32$). Moreover, the work activity in this group is distinguished by a greater reliance on overtime work (50.6% compared to 25.0% and 38.1% in cluster 2 and 3, respectively; $p=0.17$) and by longer

travel times and distances required to reach patients’ homes since 58.8% and 67.0% of nurses declared to spend 30 min or more and travel for 30 km or more to reach patients’ house, respectively. As in Cluster 1, the service is active almost every day of the week (mean = 6.5), with an average of 12.6 operating hours per day, and includes a wide range of activities. The service offered to citizens is highly accessible since the average waiting times for patients take in charge after first assessment and first access to treatment are the shortest among all groups (means = 1.9 and 2.6 days, respectively), although differences across clusters were not statistically significant. Moreover, only 25.0% of patients had to wait 4 days or more from the activation of the home care service to the first intervention received. Similarly to Cluster 1, a wide range of activities are offered in this LHAs cluster (64.6% out of the 12 identified), paired with a higher availability of family and community nurses (75.0% of LHAs) and a high percentage of nurses who primarily focus on health education (61.1% of LHAs).

Cluster 3 is structured as a ‘performance-based’ model, characterised by the employment of a higher number of freelance nurses (18.2%) compared to Cluster 1 (3.0%) and Cluster 2 (0.1%) ($p=0.03$), and a high number of physiotherapists (82.0%). Services are available less frequently, with an average opening days and hours per day of 6.0 and 9.0, respectively ($p=0.05$ and $p=0.03$, respectively, compared to other clusters). The number of nurses employed in this service is lower than average (5.6 per 10,000 residents aged over 65, compared to the general sample average of 7.1; $p=0.32$). Nurses also have a lower average age compared to other clusters (43.3 years vs. 47.3 and 45.6 in Cluster 1 and Cluster 2, respectively; $p=0.23$) and a higher percentage of university graduates (64.4% vs. 46.0% and 49.4% in Cluster 1 and Cluster 2, respectively; $p=0.07$). Unlike the other clusters, LHAs in this group provide a narrower range of services, covering on average only half of the 12 identified activities (51.5%). Telenursing services (18.2%) and family or community nurses (27.3%) are also less common, as well as care planning (23.2%) and health education (43.9%).

4.2 | Nurses’ Perception Regarding the Care Environment and Delivery in the Identified Clusters

The 2351 nurses represent 59.5% of the 3949 nurses surveyed in AIDOMUS-IT. Cluster 1 includes 1269 nurses (54.0%), Cluster 2

TABLE 2 | Cluster characteristics.

	Cluster 1	Cluster 2	Cluster 3	Total	<i>p</i>
Total number of nurses/population over 65 + *1000 inhabitants (average)	7.9 ^a	8.6 ^a	5.6 ^a	7.1	0.317
% of nurses employed by the LHA	88.7 ^a	95.2 ^a	30.4 ^b	70.8	<0.001
% of nurses who working for cooperatives or agencies	8.3 ^a	4.7 ^a	51.5 ^b	21.8	<0.001
% of freelance nurses	3.0 ^{ab}	0.1 ^b	18.2 ^{ac}	7.4	0.030
Average age of nurses	47.3 ^a	45.6 ^a	43.3 ^a	46.1	0.229
% of nurses with a university education	46.0 ^a	49.4 ^a	64.4 ^a	50.1	0.072
% of nurses who have attended a postgraduate course in home nursing	25.0	17.8	20.5	22.1	0.132
% of nurses with at least 10years of experience in home care	31.9 ^a	36.9 ^a	26.3 ^a	32.4	0.132
% of LHAs with presence of physiotherapists in the team	86.0 ^a	50.0 ^a	82.0 ^a	76.0	0.154
% of LHAs with presence of nursing aids in the team	86.0 ^a	63.0 ^a	55.0 ^a	70.0	0.229
Total number of professionals in the team (out of 5 maximum, average)	3.5 ^a	2.8 ^a	3.3 ^a	3.3	0.288
% of nurses who take at least 30 min to reach patients' homes	27.5 ^a	58.8 ^b	38.8 ^{ab}	38.2	<0.001
% of nurses who travel at least 30 km to reach patients' homes	15.8 ^a	67.0 ^b	37.4 ^c	34.2	<0.001
Number of weekly opening days (average)	6.7 ^a	6.5 ^{ab}	6.0 ^b	6.4	0.050
Daily average opening hours	11.6 ^a	12.6 ^a	9.0 ^b	11.0	0.035
Days between the assessment visit and patient take in charge (average)	2.7 ^a	1.9 ^a	2.1 ^a	2.3	0.732
Days between patient take in charge and access to treatment according to the integrated care plane (average)	3.6 ^a	2.6 ^a	3.1 ^a	3.2	0.287
% of LHAs with waiting time $\geq$ 4 days between take in charge and access to treatment	50.0 ^a	25.0 ^a	36.0 ^a	39.0	0.523
% of LHAs with Presence of first-level Home Care Services	92.9 ^a	100.0 ^a	90.9 ^a	93.9	0.718
% of LHAs with Presence of second-level Home Care Services	85.7 ^a	100.0 ^a	90.9 ^a	90.9	0.558
% of LHAs with Presence of third-level Home Care Services	85.7 ^a	100.0 ^a	81.8 ^a	87.9	0.487
% of LHAs with Presence of Mental Health Service	92.9 ^a	87.5 ^a	81.8 ^a	87.9	0.722
% of LHAs with Presence of Disability Service	78.6 ^a	75.0 ^a	45.5 ^a	66.7	0.198
% of LHAs with Presence of Chronic Conditions Service	78.6 ^a	75.0 ^a	63.6 ^a	72.7	0.718
% of LHAs with Presence of Telemedicine or Teleradiology Services	85.7 ^a	50.0 ^a	54.5 ^a	66.7	0.143
% of LHAs with Presence of Telenursing services	35.7 ^a	37.5 ^a	18.2 ^a	30.3	0.585
% of LHAs with Family and Community Nurses Services	92.9 ^a	75.0 ^a	27.3 ^b	66.7	<0.001
% of LHAs with Presence of Specialised Nursing Consultations Services	50.0 ^a	50.0 ^a	36.4 ^a	45.5	0.777
% of services provided (out of a maximum of 12)	69.0 ^a	64.6 ^a	51.5 ^b	62.1	0.044
% of nurses who usually work overtime	25.0 ^a	50.6 ^a	38.1 ^a	34.7	0.167
% of activities related to care plan management carried out by nurses (out of a maximum of 5)	96.4 ^a	97.5 ^a	87.3 ^a	93.6	0.247
% of specialised activities out of a maximum of 3 (PICCs insertion, blood transfusions, EKG)	85.7 ^a	50.0 ^b	57.6 ^b	67.7	0.012

(Continues)

TABLE 2 | (Continued)

	Cluster 1	Cluster 2	Cluster 3	Total	<i>p</i>
% of nurses who primarily focus on health education	54.7 ^a	61.1 ^a	43.9 ^b	54.7	<0.001
% of nurses who primarily focus advanced wound care	84.9 ^a	86.7 ^a	78.8 ^a	84.4	0.099
% of nurses who primarily focus on basic wound care	43.1 ^a	35.4 ^a	36.1 ^a	39.7	0.281
% of nurses who primarily focus monitoring and measurements	15.8 ^a	24.9 ^a	22.0 ^a	19.5	0.856
% of nurses who primarily focus care plans, planning, evaluation	26.8 ^a	34.4 ^a	23.2 ^a	28.4	0.453
% of nurses who primarily focus clinical and care procedures	92.4 ^a	92.9 ^a	86.4 ^a	91.5	0.161

Note: In each column, with different superscript letters are significantly different at Tukey post hoc test. Bold font indicates statistical significance.

has 686 nurses (29.2%), and Cluster 3 has 396 nurses (16.8%). As shown in Table 3, the greatest differences regarding the investigated variables were identified between Cluster 1 and Cluster 3.

In particular, Cluster 1 shows lower job satisfaction: 21% of nurses declare themselves very satisfied, while 17.4% are dissatisfied or very dissatisfied, indicating a more pronounced work-related distress compared to the other two clusters. Regarding psychosocial conditions (COPSQIII), this cluster shows the highest median value, at 43.8%, with more than half of the nurses scoring above the median. The most critical component appears to be the one related to the quality of leadership (COPSQIII_QOL), with the lowest median among the clusters (50%) and the highest percentage of nurses below the overall median (36.7%). The work environment is perceived as less favourable, with the highest percentage of nurses having a PES score below 2.5 (26.9%). This negative aspect concerns both the inadequacy of staff and resources (PES Adequacy), with the highest percentage of scores below 2.5 (42.4%), and the managerial component (PES Manager), with the highest percentage of nurses scoring below 2.5 (19.1%). A high percentage of nurses (36.6%) also reported a missed care score of 8 or higher.

In the second cluster, identified through cluster analysis, job satisfaction levels are high: 29.6% of nurses declare themselves very satisfied, while only 14.3% consider themselves dissatisfied or very dissatisfied. Additionally, the percentage of nurses who expressed the intention to leave their job (17.2%) is the lowest among the three clusters. Regarding psychosocial conditions (COPSQIII), the component related to professional development opportunities (COPSQIII_PFD) is favourable, with a median of 87.5% and only 13.7% of nurses scoring below the median. Similarly, the other psychosocial components do not show criticalities compared to the other clusters: indicators related to leadership quality (COPSQIII_QOL) and work-life balance (COPSQIII_WPC) are good, while burnout values (COPSQIII_BS) align with the general data. The work environment (PES), with a percentage of scores below 2.5 (20%), is better than the general situation and compared to Cluster 1, as are the components related to the adequacy of staff and resources (PES Adequacy), with 38% of scores below 2.5, and managerial capacity (PES Manager), with 14.4% of scores below 2.5. Worse than the other two clusters are the patient safety index values (SAQ). The most negative aspects of this cluster concern the workload related to patient care (NASA-TLX_HC-IT) with the highest median at 61.1% and 71.9% of nurses scoring above

the median. Finally, with respect to the missed care 63.4% of nurses in this cluster scored 5 or higher, and 36.7% scored 8 or higher.

Regarding the third cluster, the analysis reveals that, despite having a high percentage of very satisfied nurses (30.3%) like Cluster 2, it has the highest percentage of nurses who declare their intention to leave their job (22.7%). Among the psychosocial condition indices, those related to professional development opportunities (COPSQIII_PFD) and burnout (COPSQIII_BS) show the most negative values: 20.7% of nurses scored low on general median COPSQIII_PFD compared to 13.7% in Cluster 2. Moreover, 29.3% of nurses of this cluster scored higher than general media on COPSQIII_BS compared to about 27% in the other two clusters. The work environment, measured by PES, is perceived positively, with the lowest percentage of nurses with scores below 2.5 (19.2%); staff and resource adequacy (PES Adequacy) and managerial situation (PES Manager) are also good, with the lowest percentages of nurses who score below 2.5 (34.1% and 12.6%, respectively). Indicators related to workload (NASA) and missed care do not present criticalities. This cluster, in fact, has the lowest average score for missed care (4.5) and the lowest percentages of nurses with scores of 5 or higher (49.2%) and 8 or higher (26%).

4.3 | Patients' Perception of Care Delivery

In the 33 LHAs selected for group analysis, a total of 6851 patients participated in the study, accounting for 70.0% of the 9780 patients enrolled in AIDOMUS-IT. Based on the results of the cluster analysis, 4238 patients were classified into Cluster 1 (61.9%), 1331 into Cluster 2 (19.4%), and 1282 into Cluster 3 (18.7%).

As shown in Table 4, according to patient reports, the three clusters did not show significant differences regarding service activation times. However, in terms of other aspects of care (e.g., communication with the patient, perception of being listened to and treated with respect, perception of receiving help when needed, etc.), Cluster 1 and Cluster 2 differ from the third, with generally better indicators (values above the overall average).

Specifically, patients in Cluster 1 more frequently reported that, compared to the average values of the entire sample, healthcare professionals provided greater explanations about the treatment plan (90.7% vs. 90.1%), how to organise their home (74.1% vs.

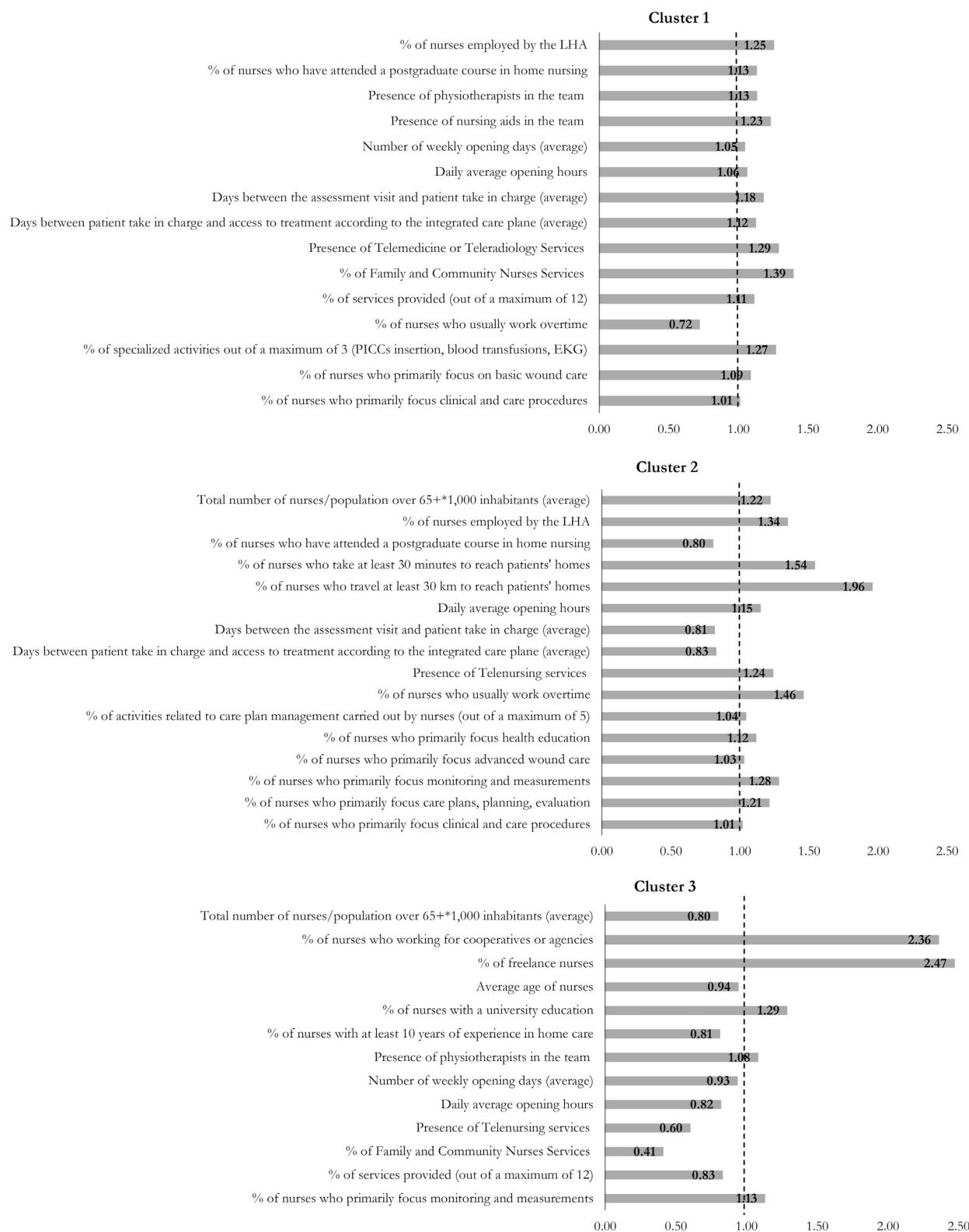


FIGURE 3 | Variables mainly characterising Clusters expressed as a ratio between the cluster average and the general average. PICCs, peripherally inserted central catheters.

71.6%), gathered information about ongoing pharmacological therapy (69.7% vs. 67.7%), and provided information on new medications (78.1% vs. 74.2%), including potential side effects (70.7% vs. 67.1%).

Patients in Cluster 2, on the other hand, more frequently stated that, compared to the overall sample average, nurses showed interest in their physical pain (92.9% vs. 86.6%) and were always up to date on the care and treatments to be provided (81.2% vs.

TABLE 3 | Nurses' perception regarding the care environment and delivery in the identified clusters (N = 1269).

Variables	Cluster 1	Cluster 2	Cluster 3	Total
Percentage of very satisfied or satisfied nurses	21.0%	29.6%	30.3%	25.1%
Percentage of dissatisfied or very unsatisfied nurses	17.4%	14.3%	14.6%	16.0%
Percentage of nurses who would like to leave the job	20.25%	17.2%	22.7%	19.7%
Perception of psychosocial conditions in the workplace – COPSQIII, median (score range 0–100)	43.8	42.2	40.6	42.2
Percentage of nurses who scored > general median	50.4%	44.0%	41.7%	47.1%
Quality of leadership – COPSQIII_QOL, median (score range 0–100)	50.0	62.5	62.5	50.0
Percentage of nurses who scored < general median	36.7%	27.1%	25.8%	32.1%
Work-private life conflict – COPSQIII_WPC, median (score range 0–100)	25.0	37.5	25.0	25.0
Percentage of nurses who scored < general median	19.5%	15.2%	19.4%	18.2%
Burnout symptoms – COPSQIII_BS, median (score range 0–100)	50.0	50.0	50.0	50.0
Percentage of nurses who scored > median	27.2%	27.7%	29.3%	27.7%
Possibilities for Development – COPSQIII_PFD, median (score range 0–100)	75.0	87.5	75.0	75.0
Percentage of nurses who scored < general median	19.7%	13.7%	20.7%	18.1%
Work environment – PES, mean (score range 1–4)	2.9	3.0	3.1	2.9
Percentage of nurses who scored < 2.5	26.9%	20.0%	19.2%	23.6%
Staffing and resource adequacy – PES Adequacy, mean (score range 1–4)	2.5	2.6	2.7	2.6
Percentage of nurses who scored < 2.5	42.4%	38.0%	34.1%	39.7%
Nurse manager ability, leadership, and support of nurses – PES Manager, mean (score range 1–4)	3.2	3.3	3.4	3.3
Percentage of nurses who scored < 2.5	19.1%	14.4%	12.6%	16.7%
Patient safety – SAQ, median (score range 0–100%)	91.7%	91.7%	91.7%	91.7%
Percentage of nurses who scored < general median	49.6%	47.1%	49.5%	48.9%
Team working climate – SAQ_TWC, median (score range 0–100%)	83.3%	83.3%	83.3%	83.3%
Percentage of nurses who scored < general median	39.8%	34.3%	39.1%	38.1%
Safety of the working climate – SAQ_SWC, median (score range 0–100%)	100.0%	100.0%	100.0%	100.0%
Percentage of nurses who scored < general median	48.6%	45.7%	49.6%	47.9%
Workload – NASA-TLX_HC-IT, median (score range 0–100)	44.2	61.1	47.9	49.5
Percentage of nurses who scored > general median	39.2%	71.9%	46.0%	49.9%
Missed care – MNC_HC, mean (score range 0–9)	5.4	5.5	4.5	5.3
Percentage of nurses who scored ≥ 5	60.3%	63.4%	49.2%	59.3%
Percentage of nurses who scored ≥ 8	36.6%	36.7%	26.0%	34.8%

77.4%). Additionally, the assessment of care was particularly positive concerning the nurse–patient relationship, with high percentages of patients reporting that nurses consistently informed them about home visit times (84.7% vs. 81.7%), provided clear and understandable explanations (85.5% vs. 80.6%), listened attentively (86.1% vs. 82.0%), and treated them with courtesy and respect (95.2% vs. 90.9%). The percentage of patients who reported always feeling that nurses genuinely cared for them was 89.7%, compared to an average value of 85.4%.

Although the indicators for patients surveyed in LHAs within Cluster 3 still show relatively high values, their percentages are generally lower than the average. The proportion of patients who reported waiting at least 6 days to receive the requested assistance was 5.3%, compared to 3.2% for the total sample and 2.8% and 2.9% for the other two groups. Below-average values were recorded for indicators related to communication aspects concerning pharmacological therapy. Furthermore, compared to the other groups, Cluster 3 showed deficiencies in indicators

TABLE 4 | Patients' perception of care delivery (N=6851).

Variables	Cluster 1	Cluster 2	Cluster 3	Total
Home care was activated promptly when needed	96.6%	96.8%	93.9%	96.2%
Healthcare providers explained which treatments and services the patient would receive	90.7%	90.5%	87.8%	90.1%
Healthcare providers explained how to organise the home	74.1%	72.9%	67.3%	72.6%
Healthcare providers described the medications the patient was taking	60.6%	57.6%	50.0%	58.0%
Healthcare providers asked to see all the medications the patient was using	69.7%	66.6%	61.9%	67.7%
Nurses were always informed and updated on all treatments or procedures to be performed	78.4%	81.2%	70.2%	77.4%
The patient had the opportunity to discuss physical pain with a home nurse	84.7%	92.9%	86.2%	86.6%
Nurses explained when to take new medications	78.1%	68.7%	66.9%	74.2%
Nurses explained possible side effects of new drugs	70.7%	61.5%	61.0%	67.1%
Nurses always informed the patient about their arrival time	83.2%	84.7%	74.0%	81.7%
Nurses provided always clear and understandable explanations	81.4%	85.5%	72.8%	80.6%
Nurses listened always attentively	82.6%	86.1%	76.1%	82.0%
Nurses treated the patient with courtesy and respect	90.7%	95.2%	87.2%	90.9%
The patient always had the sensation that nurses genuinely cared for them	85.2%	89.7%	81.4%	85.4%
Patients received the help they needed	95.2%	96.3%	94.0%	95.2%
Patient had to wait 6 days or more to obtain assistance	2.9%	2.8%	5.3%	3.2%

related to how often nurses informed patients about home visit times (74.0% vs. 81.7%), their willingness to provide clear and understandable explanations (72.8% vs. 80.6%), and their attentiveness to listening to patients (76.1% vs. 82.0%).

5 | Discussion

This study aimed to identify distinct organisational care models in Italian home care by classifying services based on structural characteristics and process factors while also exploring patients' perceptions of the care environment and service delivery within these models.

Overall, this study identified three distinct organisational models for delivering home care in Italy. Each model has unique characteristics concerning work organization, perceptions of the work environment, and patients' views on the care they receive. The key contribution of this research lies in its systematic identification and analysis of these models, highlighting their effects on both healthcare workers' well-being and the quality of nursing care. Beyond enriching the existing literature, our findings provide valuable insights for improving organisational structures and optimising resource management in home care settings, offering lessons that are relevant not only to Italy but also to other countries facing similar challenges in delivering sustainable and patient-centred home care (Van Eenoo et al. 2018).

The first cluster was characterised by a multidisciplinary approach integrating external resources and utilising innovative

solutions, such as telemedicine. This cluster had the highest presence of family and community nurses, an essential component in ensuring long-term patient management and continuity of care (Scrimaglia et al. 2024). While this model provided a wide range of services and the highest percentage of specialised procedures, it appeared to be linked to higher dissatisfaction among nurses. Specifically, nurses in this cluster reported experiencing a heavy workload, a perception of insufficient staff and resources, and a high frequency of missed nursing care. One possible explanation for this figure was the perception that leadership was ineffective in managing the organisational complexities faced by the LHAs within this cluster. Indeed, without effective management of resources and personnel, organisational complexity and the introduction of technological innovations may lead to increased stress and burnout among healthcare workers (Adams et al. 2019; Jeffery et al. 2023; Lenssen et al. 2025).

The second cluster was defined by a nurse-centred care model, with a significant number of professionals employed through public contracts. This model stood out for its generally positive psychosocial conditions, characterised by strong leadership and adequate resource availability. Our results indicated that LHAs in this cluster served a more geographically dispersed population, potentially located in rural or semi-rural areas. Despite a higher workload compared to other groups, nurses in this cluster reported high levels of job satisfaction. Moreover, patients served by these LHAs reported a strong quality of nurse–patient relationships, with particularly high scores in communication and physical pain management. These findings align with previous literature, which has consistently highlighted that a supportive work environment, effective leadership, and adequate

resources are essential for the well-being of healthcare workers (Zaghini et al. 2017) and the quality of care provided (Boamah et al. 2018; Specchia et al. 2021). However, it is crucial to acknowledge that the higher workload and increased exposure to overtime may pose risks to nurses' long-term well-being. Prolonged work strain can lead to physical and emotional exhaustion, potentially increasing the likelihood of burnout, job dissatisfaction, and workforce attrition (Almeida et al. 2024; Babapour et al. 2022). Additionally, longer travel distances can exacerbate professional burnout, further intensifying the pressures of an already demanding workload (Spector et al. 2024).

The third cluster operated under a 'performance-based' model, characterised by a lower nurse-to-patient ratio and a greater reliance on external professionals. This model offered fewer service days and hours per week, as well as a more limited range of services. While job satisfaction levels were high, several nurses expressed a strong intention to leave their positions, citing limited opportunities for professional growth compared to the other clusters. This finding is consistent with previous literature, which suggests that in performance-based models, nurses often perceive fewer opportunities for career advancement and professional development (Parreira et al. 2021). In this regard, the research by Enea et al. (2024) further supported the idea that the lack of career opportunities is one of the main factors driving nurses' intention to leave their jobs (Enea et al. 2024). Finally, in the third cluster the role of nurses in health education was significantly less emphasised and patients' satisfaction was lower than other clusters. This finding emphasised that a 'performance-based' management approach may reduce nurse-patient interactions, limiting communication opportunities and potentially weakening the quality of their relationship (Parreira et al. 2021).

Our results revealed a significant link between nurses' work activities and patient satisfaction. In the third cluster, which followed a performance-based model and involved lower-complexity tasks, nurses had fewer opportunities to communicate with patients. As a result, patients reported lower satisfaction scores in the third cluster. In contrast, the first and second clusters had nursing activities that were more focused on managing the therapeutic process, which fostered closer relationships between nurses and patients. Our findings highlight the critical implications of a performance-based model in home care, particularly its impact on nurse-patient communication and overall patient satisfaction. In this model, nurses were assigned lower-complexity tasks and had limited engagement in the broader therapeutic process. This task fragmentation restricted their ability to establish meaningful connections with patients (Parreira et al. 2021).

5.1 | Implication for Nursing Practice and Research

The findings of this study have important implications for both nursing practice and research in home care. The results show that organisational structures influence nurses' working conditions, job satisfaction, and ultimately the quality of patient care. Challenges related to leadership, resource allocation, and workload management highlighted in our analysis are not unique to Italy but are common across many healthcare systems

worldwide (Van Eenoo et al. 2018). This suggests that the models identified here could serve as a valuable reference for international strategies aimed at improving home care delivery and maintaining workforce sustainability.

In light of our findings, several priorities emerge for practice. First, home care services should establish structured workforce planning systems to balance staffing levels with patient needs and reduce the risk of missed care. Second, targeted leadership training programmes could be developed to enhance managers' capacity to guide multidisciplinary teams, particularly when new technologies such as telemedicine are introduced. Third, policies should prioritise equitable allocation of resources across regions to minimise variability in service hours and team composition, thereby reducing territorial disparities in access to home care. Finally, creating career development pathways and expanding postgraduate training opportunities for home care nurses may improve professional growth and strengthen workforce sustainability.

From a research perspective, this study provides an original contribution by systematically identifying and comparing home care organisational models in the Italian context, while simultaneously incorporating the perspectives of both nurses and patients. This dual approach enriches the existing literature and establishes a foundation for further investigation. Future research should adopt longitudinal designs to evaluate long-term outcomes, explore causal mechanisms linking organisational structures to care quality, and assess the transferability of these models to other healthcare systems.

5.2 | Limitations

Although this study provided meaningful insights into organisational care models in the Italian home care setting, it is important to recognise some limitations. The cross-sectional design of the study captured data at a single point in time, limiting the ability to establish causal relationships or assess long-term effects. An important limitation of this study concerns the inclusion of only 33 out of the 77 LHAs originally participating in the AIDOMUS-IT survey. This decision was based on the availability of complete data across both structural and process variables, which was required to perform the cluster analysis. While necessary to ensure methodological rigour, this exclusion may introduce a potential selection bias. However, the LHAs retained for analysis did not differ substantially from those excluded in terms of geographical distribution and organisational size, suggesting that the identified models are reasonably representative. Additionally, reliance on self-reported data introduced potential biases, such as social desirability and recall bias, which may affect accuracy. Moreover, the cluster analysis did not fully explore differences between clusters due to variations in survey instruments used for directors, nurses, and patients, potentially hindering direct comparisons.

6 | Conclusion

This study identified three organisational models of home care delivery in Italy: a Multidisciplinary Model, a Nurse-Centred

Model, and a Performance-Based Model, each characterised by different structural resources, workforce organization, and care processes. Leadership, availability of resources, and workload balance emerged as key elements influencing nurses' job satisfaction and patients' perception of care. Policymakers may leverage these insights to refine organisational models, optimise resource allocation, and implement targeted interventions that benefit both healthcare professionals and patients. Future research should further investigate the long-term effects of different care models through longitudinal analyses to assess their sustained impact. Additionally, evaluating the effects of these organisational models on a broader range of patient outcomes including functional status, quality of life, and long-term health improvements would provide a more comprehensive understanding of their effectiveness. Finally, assessing economic sustainability and the financial impact of various care approaches is crucial for ensuring cost-effective and high-quality service delivery.

Author Contributions

Made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; I.M., V.C., F.Z., M.D.N., M.C. and P.I. Involved in drafting the manuscript or revising it critically for important intellectual content; I.M., V.C., F.Z., M.D.N., M.C., P.I., A.Ba., R.A., L.R., L.S., D.F.M., L.L., A.Bu. and S.D.C. Given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content; I.M., V.C., F.Z., M.D.N., M.C., P.I., A.Ba., R.A., L.R., L.S., D.F.M., L.L., A.Bu., S.D.C., G.C., G.R., M.Z. and B.M. Agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. I.M., V.C., F.Z., M.D.N., M.C., P.I., A.B., R.A., L.S. and S.D.C.

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Any data utilised in this study have been lawfully acquired in accordance with The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilisation to the Convention on Biological Diversity. State that the relevant field-work permission was obtained and list the permit numbers. The authors have verified that the submission complies with the Journal's statistical guidelines. The author team includes statisticians Alessandra BURGIO and Domenico Stefano CICALA.

Ethics Statement

This study protocol was approved by the Liguria Regional Ethics Committee in November 2022 (Ref. number 675/2022—DB id 12844).

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Peer Review

The peer review history for this article is available at <https://www.webofscience.com/api/gateway/wos/peer-review/10.1111/jan.70560>.

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