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Use of Diagnostic Tests in Older Adults Living in Nursing Homes: The EDEN-41 Cohort Study adjusted by Propensity Score Matching

Elena Fuentes[1], Javier Jacob[1], Aitor Alquézar[2], Juan González del Castillo[3], Francisco Javier Montero-Pérez[4], Eric Jorge García-Lamberechts[5], Cesáreo Fernández-Alonso[6], Guillermo Burillo-Putze[7], Pascual Piñera[6], Nieves López-Delmas[1], Lara Guillén-García[1], Sira Aguiló[7], Pere Llorens[8], Òscar Miró[7], en representación de los investigadores de la red SIESTA

OBJECTIVE. This study investigates the characteristics and use of diagnostic tests in patients aged ≥ 65 years living in nursing homes who present to hospital emergency departments (EDs) for any reason.

MATERIALS AND METHODS. We conducted a retrospective, multicenter observational study using data from the EDEN (Emergency Department and Elder Needs) cohort. A total of 52 Spanish EDs participated, including all patients aged ≥ 65 years who were treated for any reason for a 1-week period in April 2019. Demographic data, baseline characteristics, and use of diagnostic tests were collected. Patients were stratified according to their place of residence (nursing home vs private home). Crude analyses were performed in the overall cohort, followed by adjusted analyses in 2 patient subgroups matched using propensity score matching with respect to the use of diagnostic tests in the ED. Odds ratios (ORs) with 95 % confidence intervals (CIs) were calculated for patients living in nursing homes.

RESULTS. A total of 23,629 patients were analyzed; the vast majority, 22,060 (93.4 %), lived in private homes, while 1,569 (6.6 %) lived in nursing homes. Nursing home residents had more comorbidities, poorer baseline functional status, and a higher prevalence of geriatric syndromes. They underwent more blood tests, conventional radiography, electrocardiograms, and microbiological cultures, but not more ultrasound examinations or invasive procedures. Propensity score matching generated 2 groups of 1,029 patients each with similar characteristics. In this matched analysis, living in a nursing home was associated with greater use of blood tests (OR, 1.278; 95 % CI, 1.043–1.565), conventional radiology (OR, 1.336; 95 % CI, 1.098–1.627), and microbiological cultures (OR, 1.347; 95 % CI, 1.077–1.686), but not with the performance of electrocardiography, ultrasound, or invasive procedures.

CONCLUSIONS. Living in a nursing home is associated with increased use of diagnostic tests among adults aged ≥ 65 years, which may generate higher costs, increased workload, and additional risks for this patient population.

Keywords: Emergency department. Older adults. Diagnostic tests. Health care management. Nursing home.

Uso de exploraciones complementarias en el anciano que vive en residencia. Estudio de cohorte EDEN-41, ajustado por Propensity Score Matching

OBJETIVO. Este trabajo investiga las características y el uso de exploraciones complementarias en pacientes de ≥ 65 años que residen en residencia y acuden a los servicios de urgencias hospitalarios (SUH) por cualquier motivo.

MATERIAL Y MÉTODOS. Se realizó un estudio observacional retrospectivo y multicéntrico utilizando datos de la cohorte EDEN *(Emergency Department and Elder Needs).* Participaron 52 SUH españoles, que incluyeron a todos los pacientes de ≥ 65 años atendidos por cualquier motivo durante un periodo de una semana en abril de 2019. Se recogieron datos demográficos, características basales y utilización de exploraciones diagnósticas. Los pacientes se estratificaron según el lugar donde vivían, residencia o domicilio particular. Se realizaron análisis crudos con la cohorte global y análisis ajustados en dos subgrupos de pacientes emparejados mediante puntuación de propensión *(Propensity Score Matching)* respecto al uso de exploraciones complementarias en urgencias y se calcularon las *odds ratio* (OR) con sus intervalos de confianza (IC) del 95 % para los pacientes que vivían en residencias.

RESULTADOS. Se analizaron 23.629 pacientes, la gran mayoría, 22.060 (93,4 %), vivían en domicilio familiar y 1.569 (6,6 %) en residencia. Los pacientes de residencia presentaron más comorbilidades, peor situación basal y más síndromes geriátricos, y en ellos se

Author Affiliations: [1]Servicio de Urgencias, Hospital Universitari de Bellvitge, Universitat de Barcelona (UB), Procesos Urgentes y Emergentes IDIBELL. L'Hospitalet de Llobregat, Barcelona, Spain. [2]Servicio de Urgencias, Hospital de la Santa Creu i Sant Pau, Barcelona, Spain. [3]Servicio de Urgencias, Hospital Clínico San Carlos, IDISSC, Universidad Complutense, Madrid, Spain. [4]Servicio de Urgencias, Hospital Reina Sofía, Córdoba, Spain. [5]Departamento de Medicina Física y Farmacología, Universidad de La Laguna, Tenerife, Spain. [6]Servicio de Urgencias, Hospital Reina Sofía, Murcia, Spain. [7]Área de Urgencias, Hospital Clínic, IDIBAPS, Universitat de Barcelona, Barcelona, Spain.[8]Servicio de Urgencias, Unidad de Estancia Corta y Hospitalización a Domicilio, Hospital Doctor Balmis, Instituto de Investigación Sanitaria y Biómedica de Alicante (ISABIAL), Universidad Miguel Hernández, Alicante, Spain.
Corresponding Author: Javier Jacob. Servicio de Urgencias. Hospital Universitari de Bellvitge. Universitat de Barcelona (UB). Procesos Urgentes y Emergentes IDIBELL. Feixa Llarga s/n, L'Hospitalet de Llobregat 08907, Barcelona, Spain.
E-mail: jjacob@bellvitgehospital.cat
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realizaban más analíticas sanguíneas, radiografías convencionales, electrocardiogramas y cultivos microbiológicos, pero no más ecografías o técnicas invasivas. El emparejamiento por puntuación de propensión generó dos grupos de 1.029 pacientes, cada uno de similares características. En este análisis, vivir en residencia se asoció a mayor uso de analíticas sanguíneas OR 1,278 (IC 95 % 1,043-1,565), radiología convencional OR 1,336 (IC 95 % 1,098-1,627), y cultivos microbiológicos OR 1,347 (IC 95 % 1,077-1,686); y no a la realización de electrocardiograma, ecografía o técnicas invasivas.

CONCLUSIÓN. Vivir en una residencia se asocia a un mayor uso de pruebas complementarias en adultos mayores de 65 años, que puede generar costes, sobrecarga y riesgos para estos pacientes.

Palabras clave: Urgencias. Anciano. Exploraciones complementarias. Gestión de la atención de salud. Residencia geriátrica.

Introduction

In recent decades, many developed countries have experienced a notable increase in life expectancy.[1] Thanks to global healthcare advances, people are living longer. In this context, one of the main challenges posed by this demographic shift is the growing consumption of healthcare resources, particularly increased use of emergency medicine resources.[2,3] This situation arises because older individuals, especially those aged 65 years and over, tend to present a higher number of chronic diseases, such as metabolic conditions—particularly diabetes—as well as osteoarticular, cardiovascular, or neurological diseases.[4-6] To this, we must add the emergence of geriatric syndromes. These consist of a set of clinical conditions common in older adults that do not easily fit into traditional disease categories but profoundly affect their quality of life and functionality.[6] Thus, the role of frailty, falls, cognitive impairment, urinary incontinence, difficulty with ambulation, and polypharmacy has become increasingly relevant.[7] These individuals with comorbidities and geriatric syndromes often require frequent hospitalizations, recurrent emergency visits, continuous medical follow-up, and rehabilitation.[8-10] As a common final outcome, many of these patients develop significant functional dependence with a need for long-term care, requiring coordination between the healthcare system and social services to provide home care, nursing home stays, day centers, or support for caregivers and family members, all of which demand substantial human and economic resources.[8-11]

In this context, the characteristics of elderly individuals living in nursing homes are particularly noteworthy, as they more frequently present loss of autonomy, social and emotional isolation, cognitive impairment, and depression, along with a higher burden of comorbidities and chronic conditions.[11,12] Therefore, elderly individuals living in nursing homes who present to a emergency department (ED) are often considered more complex patients with greater health problems, likely requiring a higher use of complementary diagnostic tests in these EDs, although this aspect has not been sufficiently investigated in our healthcare system, which is characterized by universal access and public funding.[8]

The objective of the present study was to describe the characteristics and use of complementary diagnostic tests in EDs among elderly individuals living in nursing homes and to compare them with those residing in their own homes.

Method

The Siesta Network and The EDEN Project

The SIESTA network (Spanish Investigators on Emergency Situations TeAm) was created in 2020 with the aim of generating knowledge through collaborative multicenter research, providing scientific evidence on different aspects from the perspective of emergency medicine.[13] This network developed the Emergency Department and Elder Needs (EDEN) project with the objective of providing comprehensive information on the population aged 65 years or older presenting to Spanish Eds.[14-16] The EDEN registry is a retrospective, multicenter observational study. It included all patients aged 65 years or older who presented for any reason to one of the 52 participating Spanish EDs. Episodes in which any of the recorded variables were unavailable were excluded. Data were obtained from patients' medical records, and follow-up was also conducted through medical record review. Data collection was performed using an encrypted electronic case report form, and all data were anonymized. The recruitment period lasted 7 days, from April 1st through April 7th, 2019.

The present study is named EDEN-41 and was designed to analyze the characteristics and use of complementary diagnostic tests in patients aged 65 years or older living in nursing homes who presented to an ED for any reason, compared with patients living at home.

Sociodemographic data (age and sex), comorbidities (hypertension, diabetes mellitus, dyslipidemia, ischemic heart disease, chronic kidney disease, cerebrovascular accident, peripheral arterial disease, chronic obstructive pulmonary disease, and prior heart failure), baseline status variables, Barthel Index (BI), cognitive impairment, Charlson Comorbidity Index (CCI), falls in the previous 6 months, polypharmacy defined as prescription of 5 or more baseline drugs, diagnosis of depression or use of antidepressant treatment, and ambulation status (independent, assisted, or non-ambulatory) were collected. The additional diagnostic tests analyzed included blood tests, electrocardiogram, conventional radiology, microbiological cultures, ultrasound, and invasive procedures (lumbar puncture, thoracentesis, paracentesis, endoscopy, or others).

Statistical analysis

Qualitative variables are expressed as absolute values and percentages, and quantitative variables as mean and SD, for normally distributed data (determined using the

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Kolmogorov–Smirnov test), or as medians and percentiles 25 and 75 (p25–75) for non-normally distributed data. A comparative analysis was conducted between the group living in nursing homes and the group living at home. The chi-square test was used for comparisons of qualitative variables. For variables related to the use of complementary diagnostic tests, OR, with 95 % CI, were calculated. Subsequently, an adjusted analysis was performed using a propensity score matching (PSM) model, in which individuals with a probability difference < .05 for one-year mortality were matched in a 1:1 ratio. Differences between groups were considered statistically significant if the P value was < .05 or if the 95 % CI, of the OR, excluded the value 1. Statistical analyses were performed using SPSS® Statistics V25 (IBM, Armonk, New York, USA).

Ethical considerations

The EDEN project was approved by the Clinical Research Ethics Committee of *Hospital Clínico San Carlos de Madrid* (protocol HCSC/22/005-E). Data were ensured to be anonymous and confidential. The ethical principles of the Declaration of Helsinki were followed.

Results

The EDEN registry recruited 25,557 patients, of whom 1,928 lacked data on the variable "living in a nursing home," resulting in a final cohort of 23,629 patients. Of these, the vast majority, 22,060 (93.4 %), lived at home, and 1,569 (6.6 %) lived in nursing homes (Figure 1). A total of 44.2 % were men, and the mean age was 78.3 years, with 23.7 % aged over 85 years (Table 1). Up to 32.7 % of patients had significant comorbidity with a CCI ≥ 3. Among geriatric syndromes, polypharmacy was the most frequent (63.1 %), followed by depression (13.5 %), cognitive impairment (13.7 %), and dependency with BI < 60 points (10 %).

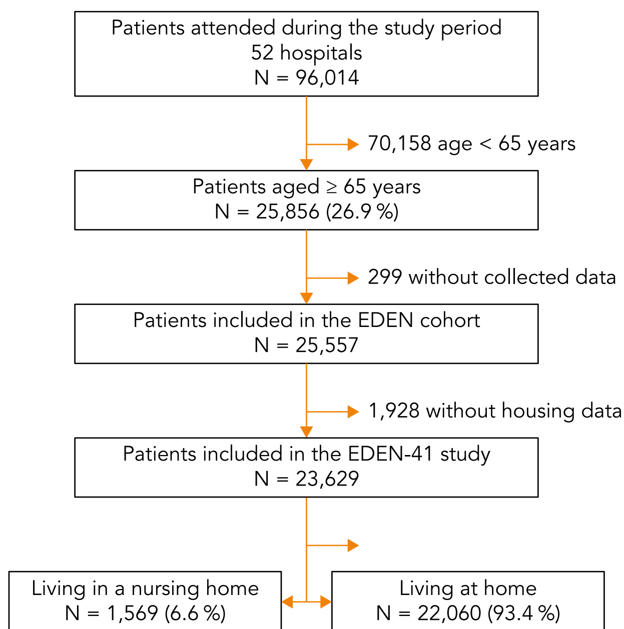

Figure 1. Flow diagram of the EDEN-41 study.

When comparing patients living at home with those living in nursing homes, significant differences were found in most variables studied, with a higher prevalence of comorbidities and all investigated geriatric syndromes in the nursing home group.

Table 2 illustrates the PSM model, which allowed the formation of two comparable groups of 1,029 patients. In these groups, epidemiological variables, medical history, and baseline status showed no statistically significant differences.

The use of additional diagnostic tests (Table 3) was high for blood tests (57.5 %), conventional radiology (57.5 %), and electrocardiograms (34.7 %). In the comparative analysis using the crude model, the nursing home group showed a higher number of complementary diagnostic tests performed, with statistically significant differences for blood tests, electrocardiograms, conventional radiology, and microbiological cultures. This was not the case for ultrasound or invasive procedures.

In the adjusted model (Figure 2), differences were confirmed in the greater use of blood tests with an OR, 1.278 (95 % CI, 1.043–1.565), conventional radiology, OR, 1.336 (95 % CI, 1.098–1.627), and microbiological cultures, OR, 1.347 (95 % CI, 1.077–1.686) in nursing home patients, but not for the remaining complementary diagnostic tests studied.

Table 1. Characteristics of patients in the EDEN-41 cohort included in the study, and bivariate analysis according to living in a nursing home or at home

	Total N = 23.629 n (%)	Home N = 22.060 n (%)	Nursing home N = 1.569 n (%)	*P* value
Epidemiological variables				
Age ≥ 85 years	5.600 (23.7)	4.686 (21.2)	914 (58.3)	< .001
Female sex	12.905 (55.8)	11.977 (55.5)	928 (60.5)	< .001
Past medical history				
Hypertension	16.617 (70.3)	15.452 (70.0)	1.165 (74.3)	< .001
Diabetes mellitus	6.629 (28.1)	6.098 (27.6)	531 (33.8)	< .001
Dyslipidemia	11.840 (50.1)	11.151 (50.5)	689 (43.9)	< .001
Ischemic heart disease	3.648 (15.4)	3.375 (15.3)	273 (17.4)	.026
Chronic kidney disease	2.663 (11.3)	2.376 (10.8)	287 (18.3)	< .001
Stroke	2.928 (12.4)	2.537 (11.5)	391 (24.9)	< .001
Peripheral arterial disease	2.315 (9.8)	2.075 (9.4)	240 (15.3)	< .001
COPD	4.485 (19.0)	4.160 (18.9)	325 (20.7)	.070
Chronic heart failure	3.435 (14.5)	3.005 (13.6)	430 (27.4)	< .001
Baseline status				
Barthel Index < 60 points	2.354 (10.0)	1.557 (7.1)	797 (50.8)	< .001
Cognitive impairment	3.244 (13.7)	2.321 (10.5)	923 (58.8)	< .001
Charlson Index ≥ 3	7.716 (32.7)	6.922 (31.4)	794 (50.6)	< .001
Falls in previous 6 months	1.717 (7.3)	1.501 (6.8)	216 (13.8)	< .001
Polypharmacy*	14.916 (63.1)	13.639 (61.8)	1.277 (81.4)	< .001
Diagnosis of depression	3.185 (13.5)	2.825 (12.8)	360 (22.9)	< .001
Ambulation				< .001
Ambulation without assistance	16.775 (71.0)	16.561 (75.1)	214 (13.6)	
Ambulation with assistance	5.323 (22.5)	4.561 (20.7)	762 (48.6)	
Non-ambulatory	1.531 (6.5)	938 (4.3)	593 (37.8)	

COPD: chronic obstructive pulmonary disease.
*Polypharmacy: five or more baseline drugs.
Bold values indicate statistical significance (*P* < .05).

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Table 2. Characteristics of patients in the EDEN-41 cohort and comparison according to living in a nursing home or at home, selected by propensity score matching

	Total N = 2.058 n (%)	Home N = 1.029 n (%)	Nursing home N = 1.029 n (%)	*P* value
Epidemiological variables				
Age ≥ 85 years	1,135 (55.2)	584 (56.8)	551 (53.5)	.144
Female sex	1,220 (59.3)	606 (58.9)	614 (59.7)	.720
Past medical history				
Hypertension	1,566 (76.1)	794 (77.2)	772 (75.0)	.256
Diabetes mellitus	718 (34.9)	340 (33.0)	378 (36.7)	.079
Dyslipidemia	948 (46.1)	468 (45.5)	480 (46.6)	.596
Ischemic heart disease	388 (18.9)	201 (19.5)	187 (18.2)	.430
Chronic kidney disease	408 (19.8)	208 (20.2)	200 (19.5)	.658
Cerebrovascular accident	496 (24.1)	245 (23.8)	251 (24.4)	.757
Peripheral arterial disease	341 (16.6)	165 (16.0)	176 (17.1)	.514
COPD	481 (23.4)	247 (24.0)	234 (22.7)	.498
Chronic heart failure	599 (29.1)	299 (29.1)	300 (29.2)	.961
Baseline status				
Barthel Index < 60 points	876 (42.6)	421 (40.9)	455 (44.2)	.130
Cognitive impairment	1,051 (51.1)	519 (50.4)	532 (51.7)	.566
Charlson Index ≥ 3	1,100 (53.4)	542 (52.7)	558 (54.2)	.480
Falls in previous 6 months	278 (13.5)	136 (13.2)	142 (13.8)	.699
Polypharmacy*	1,701 (82.7)	866 (84.2)	835 (81.1)	.071
Diagnosis of depression	461 (22.4)	217 (21.1)	244 (23.7)	.153
Ambulation				.380
Ambulation without assistance	343 (16.7)	163 (15.8)	180 (17.5)	
Ambulation with assistance	1,094 (53.2)	562 (54.6)	532 (51.7)	
Non-ambulatory	621 (30.2)	304 (29.5)	317 (30.8)	

COPD: chronic obstructive pulmonary disease.
*Polypharmacy: baseline prescription of 5 or more drugs.

Table 3. Additional diagnostic tests in patients of the EDEN-41 cohort and comparison according to living in a nursing home or at home

	Total n (%)	Home n (%)	Nursing home n (%)	*P* value
Total EDEN cohort with crude analysis (n = 23,629)				
Blood tests	13,579 (57.5)	12,349 (56)	1,230 (78.4)	< .001
Electrocardiogram	8,206 (34.7)	7,446 (33.8)	760 (48.4)	< .001
Conventional radiology	13,593 (57.5)	12,400 (56.2)	1,193 (76)	< .001
Microbiological cultures	2,444 (10.3)	2,116 (9.6)	328 (20.9)	< .001
Ultrasound	1,104 (4.7)	1,018 (4.6)	86 (5.5)	.116
Invasive procedures	657 (2.8)	605 (2.7)	52 (3.3)	.183
EDEN cohort with Propensity Score Matching adjustment (n = 2,058)				
Blood tests	1,562 (75.9)	758 (73.7)	804 (78.1)	**.018**
Electrocardiogram	994 (48.3)	488 (47.4)	506 (49.3)	.427
Conventional radiology	1,512 (73.5)	727 (70.7)	785 (76.3)	**.004**
Microbiological cultures	380 (18.5)	167 (16.2)	213 (20.7)	**.009**
Ultrasound	109 (5.3)	53 (5.2)	56 (5.4)	.768
Invasive procedures	61 (3.0)	25 (2.4)	36 (3.5)	.153

Bold values indicate statistical significance ($P < .05$).

Discussion

The results of this study show that there is an association between greater use of additional diagnostic tests in EDs and living in a nursing home, even when patients had similar baseline conditions and geriatric syndromes. Therefore, we can deduce that living in a nursing home is independently associated with increased use of certain additional diagnostic tests.

Some studies in our setting had already identified that elderly patients living in nursing homes had a more compromised baseline status, with a higher prevalence of comorbidities, functional dependence, cognitive impairment, depression, prior falls, polypharmacy, and depression.[16] These conditions favor greater use of health care resources in general, and of emergency services in particular.[17,18] However, in our study it is noteworthy that living in a nursing home was independently associated, after adjustment, with greater use of tests such as blood tests and conventional radiology. More broadly, this situation has also been identified in relation to the use of ED resources instead of more appropriate use of primary care resources.[19,20] These results may be explained by the generalization of clinical management of older adults in nursing homes, leading to cases being considered more complex and prompting the request for additional tests, especially those that are simpler for physicians, such as blood tests, radiographs, or electrocardiograms. In EDs, the care process tends to be globally structured, mainly due to the need to use standardized clinical protocols that allow rapid and safe decision-making.[21] This helps reduce errors, improve quality of care, and manage more patients with the same resources.[22] However, this process may not be appropriate for elderly patients, as they often present highly variable clinical situations requiring a more flexible, individualized, and holistic approach.[8,23] Performing additional diagnostic tests that do not add value is associated with longer ED stays, contributing to overcrowding, worsening the experience of patients awaiting test results and those waiting to be seen.[24,25]

Of note, performing blood tests is not free of associated risks, ranging from the need to repeat venipuncture due to difficulty obtaining venous access, to the ease of developing hematomas due to skin fragility, and even more serious complications related to peripheral catheter placement such as phlebitis or catheter-related infection with bacteremia.[26-28] In many cases, catheter placement is not justified, as there is a high proportion of cases in which it is not used, causing pain, increasing stress in elderly patients, or receiving inadequate care.[29]

Regarding conventional radiography, it should be noted that this technique exposes patients to radiation and is therefore not free of long-term risks. A chest radiograph exposes the patient to radiation comparable to 10 days of natural background radiation, and a chest CT scan to approximately 3 years.[30] In addition, performing these tests requires moving the patient to the radiology department, often while bedridden, requiring staff for transport, which limits the efficiency of emergency care processes due to staff saturation. Similarly, microbiological cultures require materials and laboratory procedures that are costly.

Our study has several limitations. Variables related to the reason for consultation, clinical status, patient severity in the ED, or initial diagnostic orientation were not collected, which may be related to the decision to perform certain complementary diagnostic tests, introducing potential confounding bias. Although the sample size may reduce

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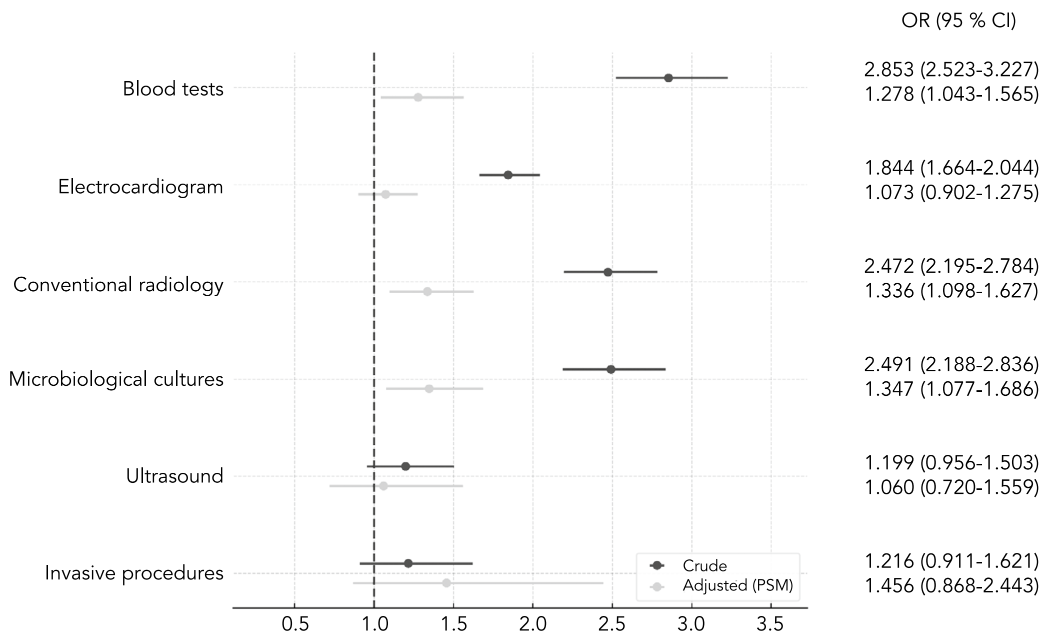

Figure 2. Crude and adjusted odds ratios by Propensity Score Matching (PSM) for additional diagnostic tests in patients living in nursing homes.

this risk, our conclusions should be interpreted considering this limitation. Furthermore, as this is a multicenter study, some centers may have more restrictive protocols and others more flexible ones regarding the decision to request these tests, which may introduce variability between centers. Nevertheless, the participation of multiple centers also helps minimize this risk. We did not analyze wither aspects of clinical safety (iatrogenesis, adverse events, etc.), which could have provided data on ineffective and potentially harmful care practices.[31]

As a conclusion, our study found that elderly patients living in nursing homes who present to EDs have a higher use of complementary diagnostic tests, particularly blood tests and conventional radiology. These results may indicate the presence of an inadequate global care process that does not add value, highlighting the need to emphasize individualized decision-making in this population. Further studies and care processes are needed to promote a rational and potentially less mechanized approach to emergency care in elderly patients.

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ADDENDUM

†Investigators of the SIESTA Network in the EDEN challenge: *Hospital Clínico San Carlos*, Madrid: Juan González del Castillo, Cesáreo Fernández Alonso, Jorge García Lamberechts, Paula Queizán García, Andrea B. Bravo Periago, Blanca Andrea Gallardo Sánchez, Alejandro Melcon Villalibre, Sara Vargas Lobé, Laura Fernández García, Beatriz Escudero Blázquez, Estrella Serrano Molina, Julia Barrado Cuchillo, Leire Paramas López, Ana Chacón García. *Hospital Universitario Infanta Cristina*, Parla: Ángel Iván Díaz Salado, Beatriz Honrado Galán, Sandra Moreno Ruíz. *Hospital Santa Tecla*, Tarragona: Enrique Martín Mojarro, Lidia Cuevas Jiménez. *Hospital Universitario de Canarias*, Tenerife: Guillermo Burillo-Putze, Aarati Vaswani-Bulchand, Patricia Eiroa-Hernández. *Hospital Norte Tenerife:* Patricia Parra-Esquivel, Montserrat Rodríguez-Cabrera. *Hospital General Universitario Reina Sofía*, Murcia: Pascual Piñera Salmerón, José Andrés Sánchez Nicolás, Yurena Reverte Pagán, Lorena Bernabé Vera, Juan José López Pérez. *Hospital Universitario del Henares*, Madrid: Martín Ruiz Grinspan, Cristóbal Rodríguez Leal, Rocío Martínez Avilés, María Luisa Pérez Díaz-Guerra. *Hospital Clínic*, Barcelona: Òscar Miró, Sònia Jiménez, Sira Aguiló Mir, Francesc Xavier Alemany González, María Florencia Poblete Palacios, Claudia Lorena

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Amarilla Molinas, Ivet Gina Osorio Quispe, Sandra Cuerpo Cardeñosa. *Hospital Universitario y Politécnico La Fe,* Valencia: Leticia Serrano Lázaro, Javier Millán Soria, Jésica Mansilla Collado, María Bóveda García. *Hospital Universitario Dr Balmis,* Alicante: Pere Llorens Soriano, Adriana Gil Rodrigo, Begoña Espinosa Fernández, Mónica Veguillas Benito, Sergio Guzmán Martínez, Gema Jara Torres, María Caballero Martínez. *Hospital Universitario de Bellvitge,* Barcelona: Javier Jacob Rodríguez, Ferran Llopis, Elena Fuentes, Lidia Fuentes, Francisco Chamorro, Lara Guillén, Nieves López. *Hospital de Axarquía,* Málaga: Coral Suero Méndez, Lucía Zambrano Serrano, Rocío Lorenzo Álvarez. *Hospital Regional Universitario de Málaga:* Manuel Salido Mota, Valle Toro Gallardo, Antonio Real López, Lucía Ocaña Martínez, Esther Muñoz Soler, Mario Lozano Sánchez. *Hospital Santa Bárbara*, Soria: Fahd Beddar Chaib, Rodrigo Javier Gil Hernández. *Hospital Valle de los Pedroches,* Córdoba: Jorge Pedraza García, Paula Pedraza Ramírez. *Hospital Universitario Reina Sofía,* Córdoba: F. Javier Montero-Pérez, Carmen Lucena Aguilera, F. de Borja Quero Espinosa, Ángela Cobos Requena, Esperanza Muñoz Triano, Inmaculada Bajo Fernández, María Calderón Caro, Sierra Bretones Baena. *Hospital Universitario Gregorio Marañón,* Madrid: Esther Gargallo García, Leonor Andrés Berián, María Esther Martínez Larrull, Susana Gordo Remartínez, Ana Isabel Castuera Gil, Laura Martín González, Melisa San Julián Romero, Montserrat Jiménez Lucena, María Dolores Pulfer. *Hospital Universitario de Burgos:* Pilar López Díez, Mónica de Diego Arnaiz, Verónica Castro Jiménez, Lucía González Ferreira, Rocío Hernando González, María Eugenia Rodríguez Palma. *Complejo Asistencial Universitario de León:* Marta Iglesias Vela, Rudiger Carlos Chávez Flores, Alberto Álvarez Madrigal, Albert Carbó Jordá, Enrique González Revuelta, Héctor Lago Gancedo, Miguel Moreno Martín, M. Isabel Fernández González. *Hospital Universitario Morales Meseguer, Murcia:* Rafael Antonio Pérez-Costa, María Rodríguez Romero, Esperanza Marín Arranz, Sara Barnes Parra. *Hospital Francesc de Borja de Gandía,* Valencia: María José Fortuny Bayarri, Elena Quesada Rodríguez, Lorena Hernández Taboas, Alicia Sara Knabe. *Hospital Universitario Severo Ochoa,* Madrid: Beatriz Valle Borrego, Julia Martínez-Ibarreta Zorita, Irene Cabrera Rodrigo, Beatriz Mañero Criado, Raquel Torres Gárate, Rebeca González González. *Hospital Clínico Universitario Virgen Arrixaca,* Murcia: Eva Quero Motto, Nuria Tomás García, Lilia Amer Al Arud, Miguel Parra Morata. *Hospital Universitario Lorenzo Guirao,* Murcia: Carmen Escudero Sánchez, Belén Morales Franco, José Joaquín Giménez Belló. *Hospital Universitario Dr. Josep Trueta,* Girona: María Adroher Muñoz, Ester Soy Ferrer, Eduard Anton Poch Ferrer. Hospital de Mendaro, Guipuzkoa: Jeong-Uh Hong Cho. *Hospital Universitario Miguel Servet,* Zaragoza: Rafael Marrón, Cristina Martín Durán, Fernando López López, Alberto Guillén Bove, Violeta González Guillén, María Diamanti, Beatriz Casado Ramón, Ana Herrer Castejón. *Hospital Comarcal El Escorial,* Madrid: Sara Gayoso Martín. *Hospital Do Salnés,* Pontevedra: María Goretti Sánchez Sindín. *Hospital de Barbanza,* A Coruña: Azucena Prieto Zapico, María Esther Fernández Álvarez. *Hospital del Mar,* Barcelona: Isabel Cirera, Bárbara Gómez y Gómez, Carmen Petrus Rivas. *Hospital Santa Creu y Sant Pau,* Barcelona: Aitor Alquézar Arbé, Miguel Rizzi, Marta Blázquez Andión, Carlos Romero Carret, Sergio Pérez Baena, Laura Lozano Polo, Roser Arenós Sambro, José María Guardiola Tey, Carme Beltrán Vilagrasa. *Hospital de Vic,* Barcelona: Lluís Llauger. *Hospital Valle del Nalón,* Asturias: Ana Murcia Olagüenaga, Celia Rodríguez Valles, Verónica Vázquez Rey. Hospital Altagracia, Ciudad Real: Elena Carrasco Fernández, Sara Calle Fernández. Hospital Nuestra Señora del Prado, Toledo: Ricardo Juárez González, Mar Sousa, Laura Molina, Mónica Cañete. *Hospital Universitario Vinalopó,* Alicante: Esther Ruescas, María Martínez Juan, Pedro Ruiz Asensio, María José Blanco Hoffman. *Hospital de Móstoles,* Madrid: Fátima Fernández Salgado, Eva de las Nieves Rodríguez, Gema Gómez García, and Beatriz Paderne Díaz.

REFERENCES

1. Pinto MH, Leite ACAB, Neris RR, Kusumota L. Experience of hopein older people with chronic illness: A meta-synthesis. Int J Older People Nurs. 2023:e12579.
2. Ukkonen M, Jämsen E, Zeitlin R, Pauniaho SL. Emergency department visits in older patients: A population-based survey. BMC Emerg Med. 2019;19:20.
3. Marincowitz C, Preston L, Cantrell A, Tonkins M, Sabir L, Mason S. Factors associated with increased Emergency Department transfer in older long-term care residents: a systematic review. Lancet Healthy Longev. 2022;3:e437-e447.
4. Gobbens RJJ, Kuiper S, Dijkshoorn H, van Assen MALM. Associations of individual chronic diseases and multimorbidity with multidimensional frailty. Arch Gerontol Geriatr. 2024;117:105259.
5. Yao L, Li Q, Zhou Z, Yin J, Wang T, Liu Y, et al. Machine learning models for predicting multimorbidity trajectories in middle-aged and elderly adults. Sci Rep. 2025;15:24711.
6. González-Colaço Harmand M. El adulto mayor en urgencias: el reto continúa. Rev Esp Urg Emerg. 2025;4:133-4.
7. Hwang U, Sifnugel N, Cohen I, Han L, Araujo K, Bianco LM, et al. The Geriatric Emergency Care Applied Research Standardization Study (GEARSS): An Observational Study of Older Emergency Department Patients. Acad Emerg Med. 2026;33:e70101.
8. Fernández Alonso C, Puig Campmany M, Aguiló Mir S, Rodríguez Miranda B, López Díez MP, Capilla Puello RM, et al. Recomendaciones del Grupo de Trabajo sobre Medicina Geriátrica de Urgencias de la Sociedad Española de Medicina de Urgencias y Emergencias sobre el cribado de fragilidad, valoración geriátrica e intervención en el Servicio de Urgencias (Recomendaciones GEM-SEMES). Rev Esp Urg Emerg. 2025;4:182-9.
9. Bima P, Morello F. Pacientes de edad avanzada usuarios frecuentes del servicio de urgencias: historias de fragilidad y comorbilidad. Emergencias. 2025;37:1-2.
10. Reinhart L, Dechartres A, Beaune S, Bonnet-Zamponi D, Chauvin A, Yordanov Y. Factores clínicos y sociodemográficos asociados con el uso frecuente de los servicios de urgencias de París por parte de personas mayores: estudio de casos y controles anidado. Emergencias. 2025;37:7-14.
11. Afonso-Argilés FJ, Comas Serrano M, Castells Oliveres X, Cirera Lorenzo I, García Pérez D, Pujadas Lafarga T, et al. Emergency department admissions and economic costs burden related to ambulatory care sensitive conditions in older adults living in care homes. Rev Clin Esp (Barc). 2023;223:585-95.
12. Vivanco MV, Formiga F, Mundet Riera I, San José Laporte A, Curto Prieto D. Población muy anciana institucionalizada de Barcelona: valoración de la fragilidad según el índice frágil-VIG y análisis de la adecuación terapéutica según los criterios STOPP-frail. Rev Esp Geriatr Gerontol. 2019;54:334-8.
13. Miró O, González Del Castillo J. Colaboración entre servicios de urgencias españoles para fomentar la investigación: a propósito de la creación de la red SIESTA (Spanish Investigators on Emergengy Situations TeAm) y de la coordinación del macroproyecto UMC-19 (Unusual Manifestations of COVID-19). Emergencias. 2020;32:269-77.
14. Miró O, González del Castillo J. EDEN: otro reto de la red SIESTA concluido con resultados muy satisfactorios. Emergencias. 2024;36:479-80.
15. Fuentes E, Jacob J, González del Castillo J, Montero-Pérez FJ, Alquézar-Arbé A, García-Lamberechts EJ, et al. Use of resources in elderly patients consulting the emergency department: analysis of the Emergency Department and Elder Needs Cohort (EDEN-21). Intern Emerg Med. 2025;20:247-56.
16. Jacob J, Fuentes E, Del Castillo JG, Bajo-Fernández I, Alquezar-Arbé A, García-Lamberechts EJ, et al. Use of diagnostic tests in elderly patients consulting the emergency department. Analysis of the emergency department and elder needs cohort (EDEN-8). Australas Emerg Care. 2024;27:268-75.
17. Aminzadeh F, Dalziel WB. Older adults in the emergency department: a systematic review of patterns of use, adverse outcomes, and effectiveness of interventions. Ann Emerg Med. 2002;39:238-47.
18. Marincowitz C, Preston L, Cantrell A, Tonkins M, Sabir L, Mason S. What influences decisions to transfer older care-home residents to the emergency department? A synthesis of qualitative reviews. Age Ageing. 2022;51:afac257.
19. Puig-Campmany M, Ris-Romeu J. Adultos mayores y urgencias de baja gravedad:¿sobreutilización de los servicios de urgencias hospitalarios?. Emergencias. 2025;37:244-6.
20. Mora T, López-Valcárcel BG, Cabezas-Peña C. Factores que influencian las consultas de baja gravedad a urgencias de los pacientes de edad avanzada en Cataluña. Emergencias. 2025;37:259-66.
21. Eitel DR, Rudkin SE, Malvehy MA, Killeen JP, Pines JM. Improving service quality by understanding emergency department flow: a White Paper and position statement prepared for the American Academy of Emergency Medicine. J Emerg Med. 2010;38:70-9.
22. McGervey M, Olson A, Mohmand M, Restrepo D. Clinical Reasoning and Diagnostic Errors. Med Clin North Am. 2025;109:997-1008.
23. Melady D, Schumacher JG. Developing a Geriatric Emergency Department: People, Processes, and Place. Clin Geriatr Med. 2023;39:647-58.
24. Guillén García L, Chamorro Martín FJ, Martín Tarapiella C, Malchair P. Experiencia del paciente: ¿una nueva perspectiva en urgencias?. Emergencias. 2023;35:468-70.
25. Bull C, Latimer S, Crilly J, Gillespie BM. A systematic mixed studies review of patient experiences in the ED. Emerg Med J. 2021;38:643-9.
26. Gledstone-Brown L, McHugh D. Review article: Idle 'just-in-case' peripheral intravenous cannulas in the emergency department: Is something wrong? Emerg Med Australas. 2018;30:309-26.
27. Willis M, Colonetti E, Bakir A, Alame YJ, Annetts M, Aygin DT, et al. Prospective observational study of peripheral intravenous cannula utilisation and frequency of intravenous fluid delivery in the emergency department-Convenience or necessity? PLoS One. 2024;19:e0305276.
28. Urbina A, Juvé-Udina ME, Adamuz J, González-Samartino M, Jiménez-Martínez E, Delgado-Hito P, et al. Association between peripheral venous catheter failure and care complexity factors in emergency department: a cross-sectional study. BMJ Open. 2024;14:e090101.
29. Alexandrou E, Ray-Barruel G, Carr PJ, Frost SA, Inwood S, Higgins N, et al. Use of Short Peripheral Intravenous Catheters: Characteristics, Management, and Outcomes Worldwide. J Hosp Med. 2018;13(5).
30. Mettler FA Jr, Huda W, Yoshizumi TT, Mahesh

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M. Effective doses in radiology and diagnostic nuclear medicine: a catalog. Radiology. 2008;248:254-63.

31. Eiroa-Hernández P, Matos S, Aguiló S, Alquézar-Arbé A, Jacob J, Fernández C, et al. Factores relacionados con la práctica de sondaje vesical en urgencias en pacientes ancianos y su relación con el pronóstico: resultados del estudio EDEN-30. Emergencias. 2023;35:415-22.

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