Review

Greek fragility hip fracture registry 2024 annual report

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Abstract

The Greek fragility hip fracture registry has been established since 2022 with the valuable involvement of many orthopaedic departments across the country. Its presence has significantly helped to create an enthusiastic team that aims to improve the health services that these patients receive in our country. The registry has helped to depict the present situation of the services that the patients with a fragility hip fracture receive in the Greek hospitals and also establish the first benchmarking of our system.

The present study is the annual report of the year 2024, the second full year that the registry runs. During this year two new orthopaedic departments have been added to the registry

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team, helping to raise the numbers of the collected patients to almost one thousand. The use of the minimum common data set, as suggested by the FFN global network, helped the Greek registry to collect important demographic, pre-injury status, fragility hip fracture, surgery and rehabilitation data for these patients. The length of stay of the patients during 2024 remained at the 10 days but the 30-day mortality has been slightly raised to 14.5% for this year.

Keywords

Hip fracture audit; national registry; Greece, fragility fracture; neck of femur fracture

Introduction

The incidence of fragility fractures is increasing the last years. Especially the hip fractures pose a significant burden in the health care systems across the globe. Registries have been used in many countries in order to document the current situation in the respective countries and also identify specific systemic weaknesses, which can help to improve the health services provided to these patients. It has been reported that large scale implementation of such registries help to improve the timing to surgery, the 30-day mortality, and even the quality of life of these patients.[1,2] For this reason many national registries have been established across the globe and especially across Europe.[3]

In Greece a pilot national hip fracture registry has been established from 2022 after an initiative of the Greek fragility fracture network (FFN Gr).[4] The aim of the present study is to present the annual report of the second year of its implementation. The Greek fragility hip fracture registry uses the minimum common data set as proposed by the global fragility fracture network with the addition of the 30-day mortality of the patients.[5]

2024 Annual Report

Involved Departments

The Greek Fragility hip fracture registry, during 2024, continued functioning for the second year. During this period two new Orthopaedic departments joined the group of Greek Registry. These departments are the First Academic Orthopaedic Department of Aristotle University of Thessaloniki, Papanikolaou General University Hospital of Thessaloniki and the Trauma & Orthopaedics Department of Tzaneio General Hospital of Piraeus. These raised the number of the involved departments to nine. Furthermore, four more Orthopaedic departments from across the county expressed their willingness to participate to this project and started the processes for their inclusion (Figure 1).

Data Collected

Data from a total of 998 patients were collected during 2024 raising the total number of the included patients in the Greek registry to 2003. The mean age of the patients during 2024 was 82.44 ±8.3years similar to the registry average of 82.35 ±8.4 years. The majority of the patients were female (69.2%) which is slightly lower than to the registry average (70.6%) (Figure 2).

Most entries this year were made by the Patras University Hospital followed by the Papanikolaou University General hospital of Thessaloniki (Figure 3).

The summer was the season with most fragility hip fracture admissions, with June being the busiest month of 2024 (Figures 4 and 5).

Patients' pre-injury status

The mean ASA grade of the fragility hip fracture patients was 2.85 ±0.9 this year, slight higher than the registry average (2.72 ±0.87). The cognitive status of the majority of the patients was normal (69%) but a total of 12% was found to have positive tests for cognitive impairment at admission without having an already diagnosed dementia (Figure 6).

The majority of the patients were living in their own house (95%) and were independent prior to the injury with a total of 68% being able to mobilize without any aids or with only one stick outside their house (Figures 7 and 8).

Figure 1. Geographic map of Greece where the involved departments are annotated with a star.

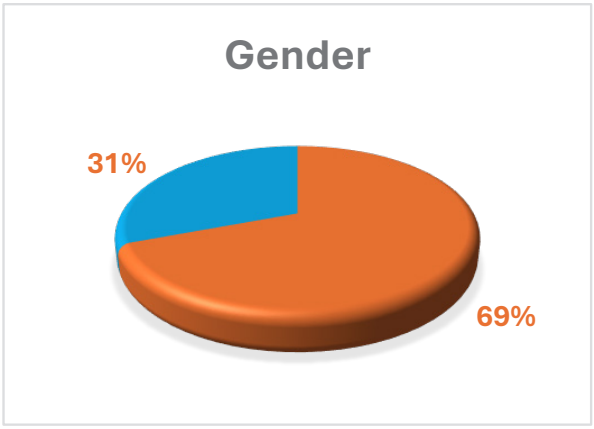

Figure 2. Gender distribution of the 2024 cohort.

Fracture type information

The Greek elderly patients sustain most frequerntly intertrochanteric type of hip fragility fracture, and this was the case again for 2024 (Table 1; Figures 9 and10).

Surgical Procedure Information

Surgery was elected as not suitable for 6.5% of the patients, who followed conservative management. Table 2 summarises the types of operations performed (table 2). The rest received an operation, which was performed under spinal anesthesia for the majority of the patients (75%) (Figure 11). Unfortunately, only for the 34% of the patients the operation performed in a timely manner (within 48 hours from admission), illuminating for another time the significant problem of lack of theatre time and anesthesiologists in the Greek Hospitals (Figure 12).

Hospitalization

The length of stay during 2024 for the fragility hip fracture patients was 10.4 ±8 days, similar to the average of the Greek registry which is 10.6 ±8.2 days. The in hospital mortality was 4.5%. More than half of the patients (62%) were mobilized off bed the first post-operative day (Figure 13), while 16% developed a new pressure sore during their hospitalization (Figure 14). Internal medicine doctors supported their orthopaedic colleagues at the treatment of 61% of these patients, emphasizing the lack of specialized Ortho-geriatricians in Greece.

Discharge Data

Most of the patients were discharged home (58%) after their admission for the fragility hip fracture, while the rehabilitation center as exit destination raised this year to 32% (Figure 15).

Only 16.2% of the patients discharged from hospital with information about starting, continuing or changing their anti-osteoporotic medication, with the majority remaining without secondary prevention attempt (Figure 16).

Follow-up Data

The 30-day mortality for 2024 was 14.5%, slightly raised than 2023, raising the total registry 30-day mortality to 10.6%. Note that during Autumn the 30-day mortality was lower than the rest of the seasons (Figure 17).

Discussion

During 2024 the fragility hip fracture registry kept rising adding almost 1000 new patients in the database. This fact helped the registry to be established and also can provide with more reliable results about the situa-

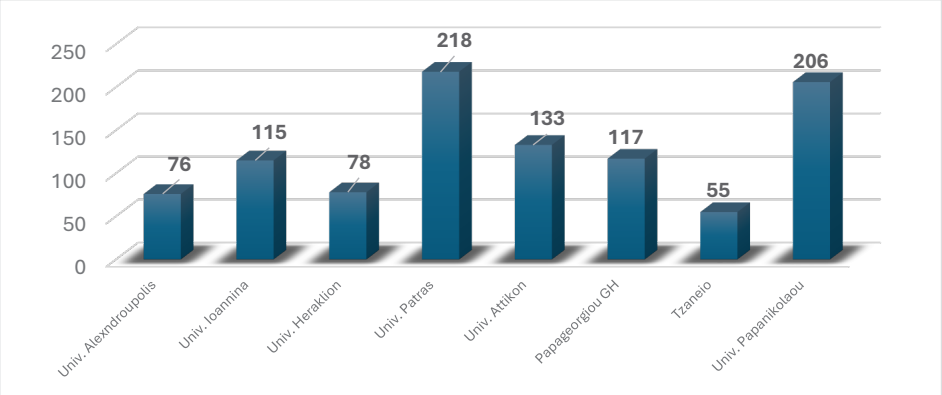

Figure 3. *2024 entries from the different hospitals involved*

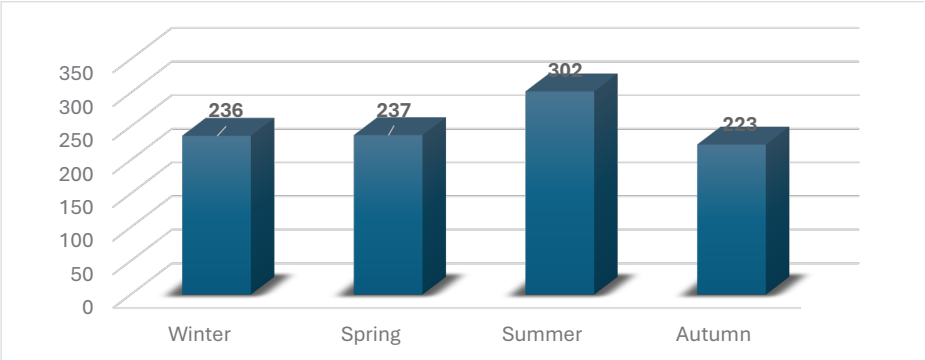

Figure 4. *2024 entries as distributed across the year*

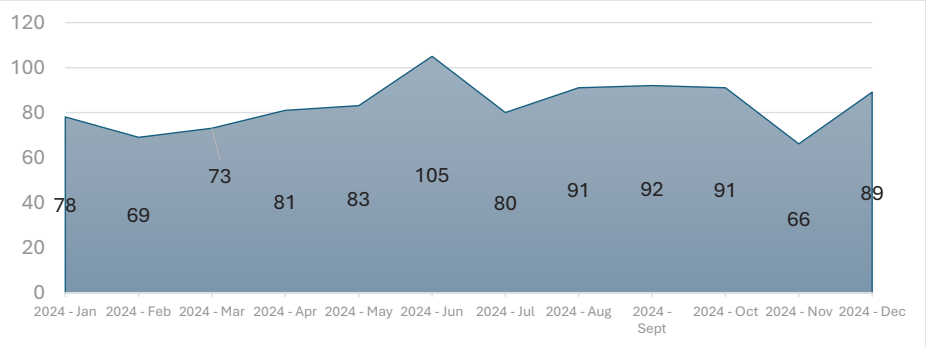

Figure 5. *2024 entries as distributed across the months of the year*

tion in the Greek health care system. Significant findings of this year's report are the unique feature of the Greek population having more extra-capsular fractures than intra-capsular ones as well as the high incidence of patients living at their own home before the injury. Interestingly in all the European hip fracture registries the intra-capsular fractures are more frequent than the extra-capsular ones. The only countries that this feature is reversed is in Greece and in Spain, illuminating a possible difference in the mechanism of these injuries or individual profile of these patients in these two Mediterranean countries.[3] Another mostly cultural unique feature of the Greek population is the increased percentage of patients living in their own

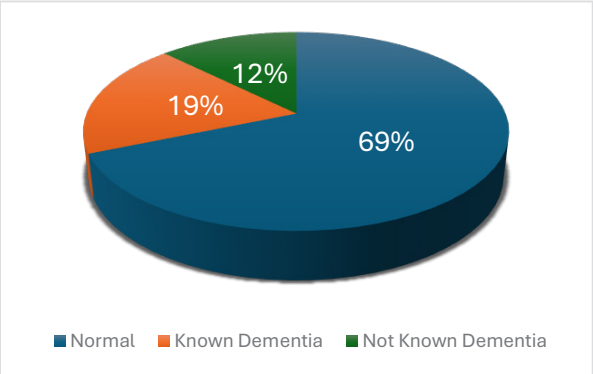

Figure 6. *Cognitive status of the cohort.*

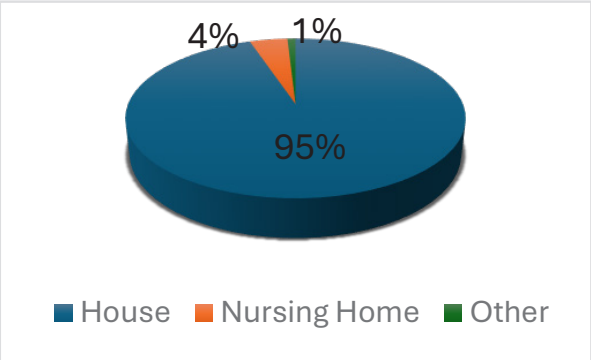

Figure 7. *Patients' pre-injury residence*

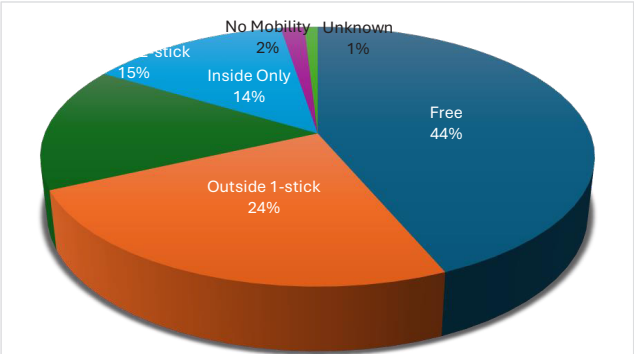

Figure 8. *Patients' pre-injury mobility status*

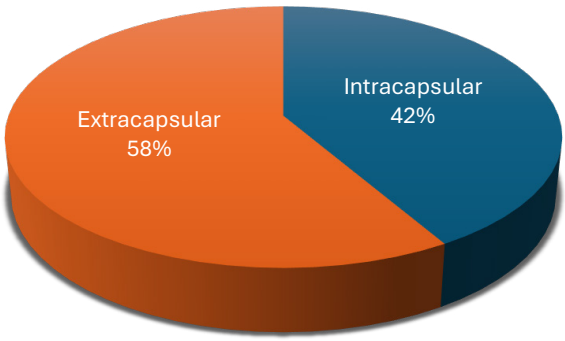

Figure 9. *Fragility hip fracture types in 2024*

Table 1 Distribution of fracture types in the cohort

Fracture Type	**No**	**%**
Intracapsular Undisplaced	28	2.8
Intracapsular Displaced	387	38.9
Intertrochanteric	520	52.3
Subtrochanteric	44	4.4
Other	16	1.6

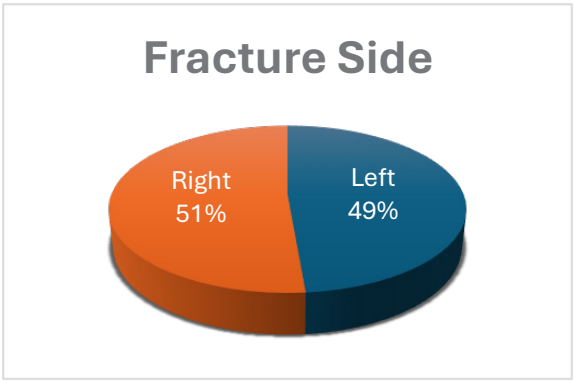

Figure 10. *Fracture side percentage in 2024*

house before the injury. In Greece this percentage is reported to reach 95%, which is the highest in Europe, with only Italy running close to this with 90%.[3]

The mortality rate of the Greek cohort was raised to 14.5% during 2024, comparing the previous year, which was significantly lower.[4] Despite that it is still remains in levels comparable to the other European countries.[3] This fact can be possibly explained by the fact that only 30% of the patients are being operated within 48 hours from admission, which is proven to be an important factor for these patients. Other countries have managed to achieve percentages of operations in a timely manner over 80%, with only Italy and Spain scoring relatively low in this feature (65% and 48%, respectively).[3]

The present fragility hip fracture registry is the first

Table 2. Types of operations performed during 2024		
Type of Operation	**No**	**%**
Conservative Management	64	6.7
Cannulated Hip Screws	5	0.5
Dynamic Hip Screw	1	0.1
IM nail	510	53.7
Hip Hemiarthroplasty	321	33.8
Total Hip Arthroplasty	27	2.8
Other	22	2.3

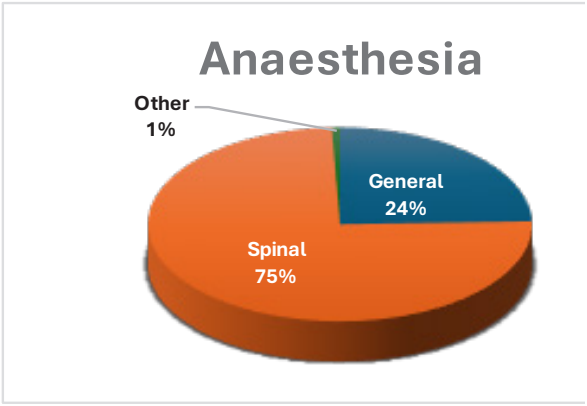

Figure 11. *Type of anaesthesia*

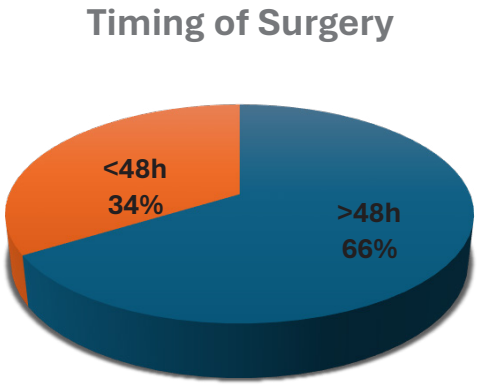

Figure 12. *Time to surgery distribution across the cohort.*

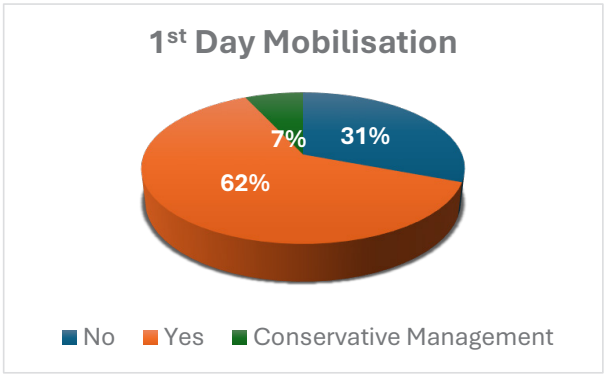

Figure 13. *Percentage of patients managed to be mobilised doff bed during the 1st post-operative day.*

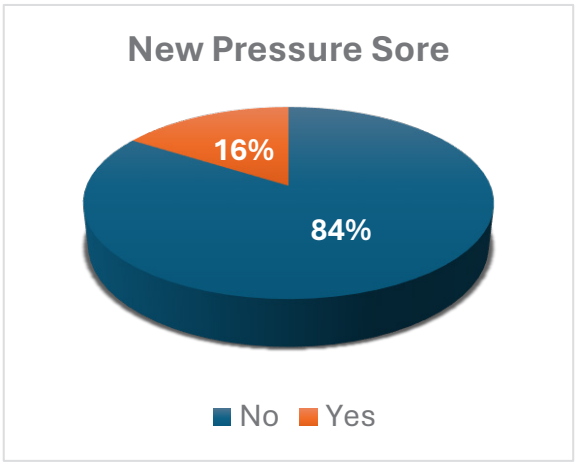

Figure 14. *Percentage of patients developed a new pressure sore during the acute hospital admission*

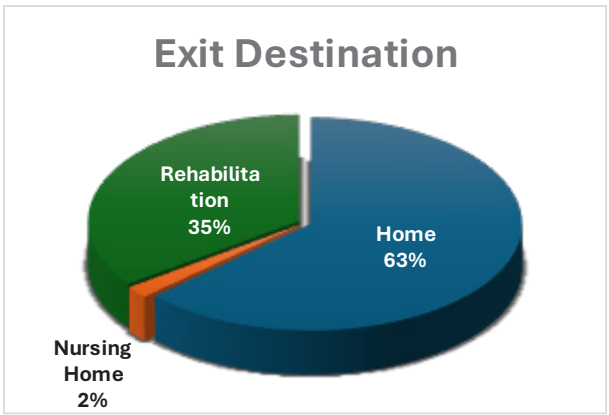

Figure 15. *Destination of discharge.*

such multicentre study in the Greece. Earlier single centre reports, illuminate similar mortality rates in central and northern Greece.[6,7] The development and establishment of this national registry hopefully will be the stepping stone for developing an effective fracture liaison service nationwide (FLS), which as mentioned in previous studies lacks significantly in the country.[8–10] Such national registry provides the health care professional across the country with the tools to investigate the present status of the Greek patients and

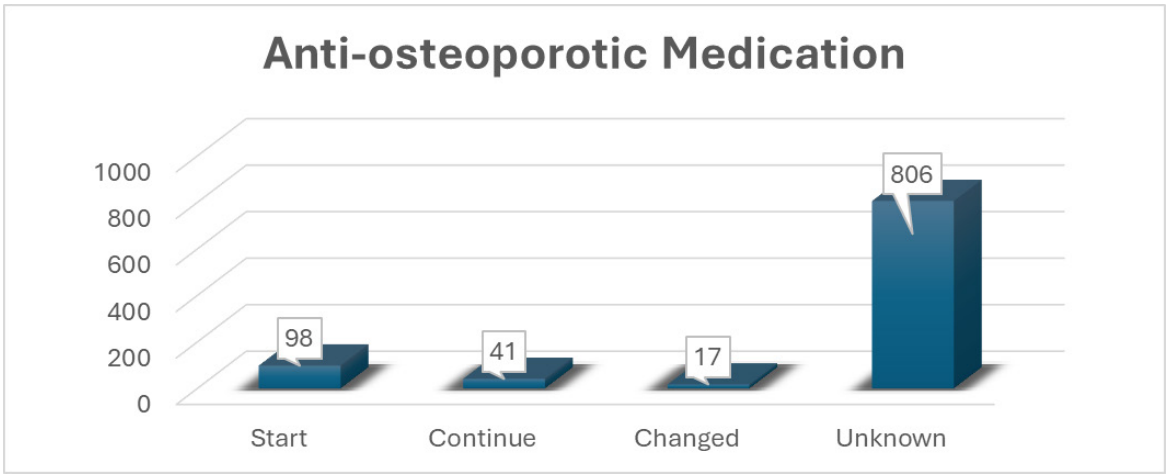

Figure 16. *Secondary prevention during first admission*

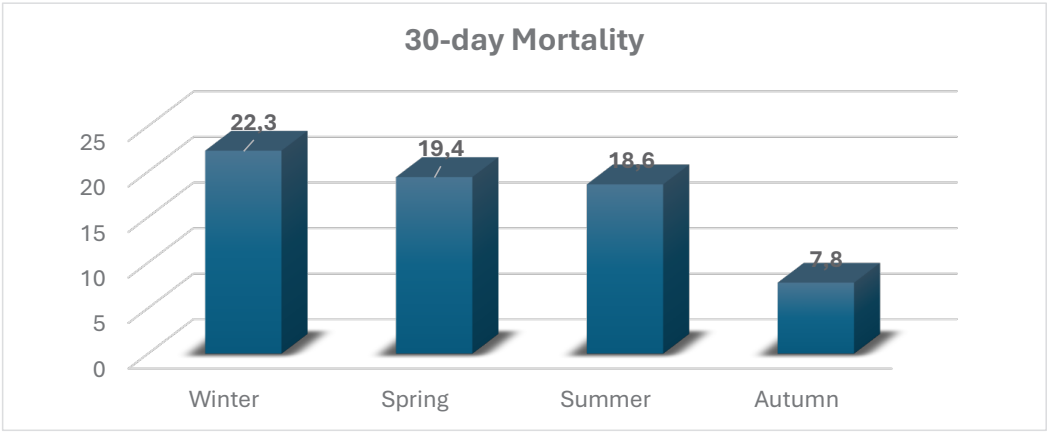

Figure 17. *30-day mortality rates across the year 2024*

also gives the first data for planning an effective FLS system, individualised in the Greek patients' profile.

Conclusions

2024 was a significant year for the Greek Fragility Hip Fracture registry. The combined efforts of the whole team led to the establishment of the project, as it managed to stay functional for a second year. The results of the first year have been presented in many local, national and international congresses (Including the Annual Orthopaedic Congress of OTEMATH and HAOST, as well as the 2nd European FFN Meeting in Istanbul), winning the prize of the best presented abstract in the 2nd European FFN Meeting. The first year's analysis of the registry was published in September of 2024 in the Archives of Osteoporosis Journal.[4]

During 2024 the team of the Greek Fragility Hip fracture registry grew significantly, with the inclusion of the two new orthopaedic departments as well as the four others that are in the inclusion process. We are looking forward for 2025 with the view of expanding the Registry team and extracting significant information about the Greek patients, which will be used to enhance the quality of the health services they receive across the nation.

References

1. Neuburger J, Currie C, Wakeman R, Tsang C, Plant F, De Stavola B, et al. The Impact of a National Clinician-led Audit Initiative on Care and Mortality after Hip Fracture in England. Med Care. 2015;53(8):686–91.
2. Griffin XL, Achten J, Parsons N, Costa ML, collaborators Wh. Does performance-based remuneration improve outcomes in the treatment of hip fracture? RESULTS FROM THE WHITE MULTICENTRE HIP FRACTURE COHORT. Bone Joint J. 2021;103(5):881–7.
3. Werner M, Macke C, Gogol M, Krettek C, Liodakis E. Differences in hip fracture care in Europe: a systematic review of recent annual reports of hip fracture registries. Eur J Trauma Emerg Surg [Internet]. 2022;48(3):1625–38. Available from: https://doi.org/10.1007/s00068-021-01797-8
4. Iliopoulos E, Tosounidis T, Moustafa RM, Tilkidis F, Daskalakis I, Melissaridou D, et al. The use of minimum common data set in the development of the Greek Fragility Hip Fracture Registry in the Greek health care setting: the first year of its pilot implementation. Arch Osteoporos [Internet]. 2024;19(1):85. Available from: https://doi.org/10.1007/s11657-024-01443-x
5. Johansen A, Ojeda-Thies C, Poacher AT, Hall AJ, Brent L, Ahern EC, et al. Developing a minimum common dataset for hip fracture audit to help countries set up national audits that can support international comparisons. Bone Joint J. 2022;104(6):721–8.
6. Dailiana Z, Papakostidou I, Varitimidis S, Michalitsis SG, Veloni A, Malizos KN. Surgical treatment of hip fractures: factors influencing mortality. Hippokratia. 2013;17(3):252.
7. Konstantinou P, Kostretzis L, Fragkiadakis G, Touchtidou P, Mavrovouniotis A, Davitis V, et al. Exploring Quality of Life and Mortality in Pertrochanteric Fragility Hip Fractures in Northern Greece: A Single Tertiary Center Study. J Clin Med. 2024;13(9):2478.
8. Iliopoulos E. The Greek challenging reality of fragility fractures and inspirations for the future. Acta Orthop Traumatol Hell. 2023;74(3).
9. Altsitzioglou Pavlos; Mavrogenis Andreas; Makras Polyzois. Fracture Liaison Services (FLS): a Review. acta Orthop Traumatol Hell. 2025;74(2):6–15.
10. Makras P, Babis GC, Chronopoulos E, Karachalios T, Kazakos K, Paridis D, et al. Experience gained from the implementation of the fracture liaison service in Greece. Arch Osteoporos. 2020;15:1–8.

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