

The Socio-Economic Impact Produced by Patients with Dementia and Hip Fractures

**Andrei Vlad BRADEANU¹,
Alexandru Bogdan CIUBARA²,
Stefan Lucian BURLEA³,
Anamaria CIUBARA⁴**

¹Dunarea de Jos University of Galati,
Faculty of Medicine and Pharmacy,
Galati, Romania.

²“Dunarea de Jos” University of
Galati, Galati, Romania.

³“Grigore T. Popa” University of
Medicine and Pharmacy, Iasi,
Romania.

⁴“Dunarea de Jos” University of
Galati, Galati, Romania.

Abstract: *Age is one of the most important parameters influencing the occurrence of hip fractures in patients over the age of 65 but also their mental state is a decisive factor. In the first three months, older adults have eight times higher risk of dying of a hip fracture if compared with people who have not suffered such type of injury. In the last 10 years, several studies showed considerable increase in the well-being of patients who have both pathologies but for the caregivers it proved to be a very hard task. The management of hospitalization costs of dementia and hip fracture patients cannot include only the period of hospitalization, but should also include the 1-year period of recovery. In UK, the annual incidence of hip fracture is 79,243, accident and emergency costs per hip fracture is 297 pounds and hospitalization costs per hip fracture is 13,765 pounds. Health and social care for hip bone fractures in one year amounts to 2 billion euros but specialists expect the number of hip fractures to increase reaching 104,000 cases by 2025.*

Keywords: *hip fracture; dementia; socio-economic impact.*

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Age is one of the most important parameters influencing the occurrence of hip fractures in patients over the age of 65 but also their mental state is a decisive factor. In the first three months, older adults have eight times higher risk of dying of a hip fracture if compared with people who have not suffered such type of injury. The risk of death still continues in the first ten years. In 1990 there were around 1.31 million people with hip fracture in the world and it will be an exponential increase of hip fracture in 2050 reaching 6.3 million. High incidence of hips fracture worldwide includes: South America, Europe and Middle East part of Europe. More than 35,000 Canadians and more than 270,000 Americans suffer from hip fracture annually.

Otherwise, the number of people who suffer from dementia was 47.5 million in 2015 but the increase is exponential and will reach 75.6 million in 2030 and 135.46 in 2050. Dementia incidence doubles every 5 years in people aged 65 to 90 and it will be twofold in Europe, threefold in Asia, fourfold in Latin America and more than twofold in America in 2050 (Dharmarajan & Banik, 2006; Beaupre et al., 2006; Cummings et al., 1995; Lyons, 1997; Brennan-Olsen, 2018).

In the last 10 years, several studies showed considerable increase in the well-being of patients who have both pathologies but for the caregivers it proved to be a very hard task. For relatives caring for people with dementia and bone fracture it is more difficult and burdensome than caring for loved ones with other pathologies and disabilities. The most common profile for caregivers is white female married with children and middle study with full or part-time job who mainly take care of their parents.

More in-depth studies about noticed that dementia caregivers suffer a lot of negative effects such as depression and show a higher risk to develop anxiety than nondementia caregivers. One such dementia caregiver spent more hours per day helping the patient (Serban & Tataru, 2018): to get out of bed or chair, get dressed, get to the toilet and come back, shower or bathe, get fed, take pills or other medication and injections. The nondementia caregiver has different types of tasks: manage finances, go shopping, prepare meals and transportation to the market/shop or other places and come back. The impact on the socioeconomic life of caregivers who are employed is that they have to accept jobs without claims, take retirement early and, most importantly, give up work entirely (Ory et al., 1999; Sulkava et al., 1985)

Families may be motivated to provide care for dementia patients for several reasons: love or reciprocity, spiritual fulfillment, debt sense, guilt, social pressures and greed. People who do these things out of obligation are

at greater risk of having psychological problems (Fesun, 2019) than caregivers. In the USA, one quarter of dementia caregivers provide about 40 hours per week including bath, nourishment, toilet, dressing, while in developing countries it is around 12 hours per week as they are also attending their own everyday activities.

A 1994 to 1998 study on 238 patients suffering from hip bone fracture (35% trochanteric fracture treated by osteosynthesis, 52% collar fracture femur treated by hemiarthroplasty and 13% collar fracture femur received total prosthesis) provides an analysis about the hospitalization period. The normal hospitalization period for geriatric people was 18 days, for patients with mild dementia was 29 days while for people with moderate dementia was 47 days. (Johansson & Skoog, 1996; Johnell & Kanis, 2006). Successful rehabilitation of patients without dementia was 20 times higher than in patients with dementia and the average of geriatric hospitalization of patients with dementia was 34 days (Buchner & Larson, 1987; Kyo et al., 1993; Parker & Palmer, 1995).

The management of hospitalization costs (Tomaziu-Todosia, 2019) of dementia and hip fracture patients cannot include only the period of hospitalization, but should also include the 1-year period of recovery. Costs can include: surgery intervention, surgery implants, laboratory and radiological investigation, medication prescribed and other treatment and investigation for associated comorbidities such as arterial hypertension, diabetes, arthritis and renal failure.(14) These comorbidities will greatly influence the price but the costs is influenced by the number of hospitalization days. (Hernlund et al., 2013; Burge et al., 2001; Stevenson et al., 2006). A hip fracture should normally be operated within the first 24 hours (Roche et al., 2005). For example, the approximate hospitalization costs in 2002 in Singapore only for treatment of hip fractures without dementia was 7367 \$. In 2010, in the European Union, there were approximately 600,000 hip fractures costing 20 billion euros. In UK, the annual incidence of hip fracture is 79,243, accident and emergency costs per hip fracture is 297 pounds and hospitalization costs per hip fracture is 13,765 pounds (National Clinical Guideline Centre, 2011). Health and social care for hip bone fractures in one year amounts to 2 billion euros but specialists expect the number of hip fractures to increase reaching 104,000 cases by 2025 (Nurmi et al., 2003; Luo & Xu, 2005; Barr et al., 2005; Fleurence et al., 2004).

In the near future all governments in the world will want to reduce the costs of hospitalization (Marinescu & Gheorghiu, 2019) through:

decreasing the patient's length of hospital stay, early screening of patients with osteoporosis, treatment of osteoporosis with bisphosphonate, calcium and vitamin D supplements to prevent hip fractures, use of hip protectors, education of young people about this diseases (Pasco et al., 2005; Wiktorowicz et al., 2001; Liporace et al., 2005; Parker et al., 2006; Brecht et al., 2004; Willis, 2002). In the US, hospitalization costs for only one patient with delirium amounts to 60516 \$, and for all patients with this pathology it reaches 143 billion \$ (Pandharipande et al., 2005).

In Canada the costs for patients with delirium pathology in one year is estimated to be 1.25 billion\$ (74 million \$ for drugs, hospitalization and diagnosis; 10 million \$ for research; 389 billion \$ for public information campaigns; 615 million \$ for paid services) (Hay & Ernst, 1987).

References

- Barr, R. J., Stewart, A., Torgerson, D. J., Seymour, D. G., & Reid, D. M. (2005). Screening elderly women for risk of future fractures – participation rates and impact on incidence of falls and fractures. *Calcif Tissue Int*, 76(4), 243-248. <https://doi.org/10.1007/s00223-004-0101-5>
- Beaupre, L. A., Cinats, J. G., Senthilselvan, A., Lier, D., Jones, C. A., Scharfenberger, A., Johnston, D. W., & Saunders, L. D. (2006). Reduced morbidity for elderly patients with a hip fracture after implementation of perioperative evidence-based clinical pathway. *Quality and Safety in Health Care*, 15(5), 375-9. <https://doi.org/10.1136/qshc.2005.017095>
- Brecht, J. G., Kruse, H. P., Mohrke, W., Oestreich, A., & Huppertz, E. (2004). Healtheconomic comparison of three recommended drugs for the treatment of osteoporosis. *International Journal of Clinical Pharmacology Research*, 24(1), 1-10. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/15575171>
- Brennan-Olsen, S. (2018). Why hip fractures in the elderly are often a death sentence. *The Conversation*. Retrieved from <https://theconversation.com/why-hip-fractures-in-the-elderly-are-often-a-death-sentence-95784>
- Buchner, D. M., & Larson, E. B. (1987). Falls and fractures in patients with the Alzheimer's type dementia. *JAMA: The Journal of the American Medical Association*, 257(11), 1492. <https://doi.org/10.1001/jama.1987.03390110068028>
- Burge, R. T., Worley, D., Johansen, A., Bhattacharyya, S., & Bose, U. (2001). The cost of osteoporotic fractures in the UK: projections for 2000–2020. *Journal of Medical Economics*, 4(1-4), 51–62. <https://doi.org/10.3111/200104051062>

- Cummings, S. R., Nevitt, M. C., Browner, W. S., Stone, K., Fox, K. M., Ensrud, K. E., Cauley, J., Black, D., & Vogt, T. M. (1995). Risk factors for hip fracture in white women. *New England Journal of Medicine*, 332(12), 767-73. <https://doi.org/10.1056/nejm199503233321202>
- Dharmarajan, T. S., & Banik, P. (2006). Hip fracture: Risk factors, preoperative assessment, and postoperative management. *Postgraduate Medicine*, 119(1), 31-38. <https://doi.org/10.3810/pgm.2006.06.1638>
- Fesun, H. (2019). Relationship between the syndrome of emotional burnout and characterological qualities of a person, comparative aspect. *Revista Romaneasca pentru Educatie Multidimensionala*, 11(1), 57-72. <http://dx.doi.org/10.18662/rrem/96>
- Fleurence, R. L. (2004). Cost-effectiveness of fracture prevention treatments in the elderly. *International Journal of Technology Assessment in Health Care*, 20(2), 184-191. <https://doi.org/10.1017/s0266462304000960>
- Hay, J. W., & Ernst, R. L. (1987). The economic costs of Alzheimer's disease. *American Journal of Public Health*, 77, 1169-1175. <https://doi.org/10.2105/ajph.77.9.1169>
- Hernlund, E., Svedbom, A., Ivergard, M., Compston, J., Cooper, C., Stenmark, J., McCloskey, E. V., Jonsson, B., & Kanis, J. A. (2013). Osteoporosis in the European Union: medical management, epidemiology and economic burden. *Archives of Osteoporosis*, 8, 136. <https://doi.org/10.1007/s11657-013-0136-1>
- Johansson, C., & Skoog, I. (1996). A population-based study on the association between dementia and hip fractures in 85-year olds. *Aging Clinical and Experimental Research*, 8(3), 189-96. <https://doi.org/10.1007/bf03339676>
- Johnell, O., & Kanis, J. A. (2006). An estimate of the worldwide prevalence and disability associated with osteoporotic fractures. *Osteoporosis International*, 17(12), 1726-1733. <https://doi.org/10.1007/s00198-006-0172-4>
- Kyo, T., Takaoka, K., & Ono, K. (1993). Femoral neck fracture. Factors related to ambulation and prognosis. *Clinical Orthopaedics and Related Research*, 292, 215-22. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/8519112>
- Liporace, F. A., Egol, K. A., Tejwani, N., Zuckerman, J. D., & Koval, K. J. (2005). What's new in hip fractures? Current concepts. *American Journal of Orthopedy*, 34, 66-74.
- Luo, L. Z., & Xu, L. (2005). Study on direct economic-burden and its risk factors of osteoporotic hip fracture. *Zhonghua Liu Xing Bing Xue Za Zhi*, 26(2), 669-672. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/16471214>
- Lyons, A. R. (1997). Clinical outcomes and treatment of hip fractures. *American Journal of Medicine*, 103(2), 51S-63S. [https://doi.org/10.1016/s0002-9343\(97\)90027-9](https://doi.org/10.1016/s0002-9343(97)90027-9)

- Marinescu, A., & Gheorghiu, S. (2019). Ethics controlling military medical practice. *Logos Universality Mentality Education Novelty: Philosophy & Humanistic Sciences*, 7(1), 51-77. <http://dx.doi.org/10.18662/lumenphs/18>
- National Clinical Guideline Centre. (2011). *Hip fracture: The management of hip fracture in adults*. Retrieved from <https://www.nice.org.uk/guidance/cg124/evidence/full-guideline-183081997>
- Nurmi, I., Narinen, A., Luthje, P., & Tanninen, S. (2003). Cost analysis of hip fracture treatment among the elderly for the public health services: A 1-year prospective study in 106 consecutive patients. *Archives of Orthopaedic and Trauma Surgery*, 123(10), 551-554. <https://doi.org/10.1007/s00402-003-0583-z>
- Ory, M. G., Hoffman, R. R., Yee, J. L., Tennstedt, S., & Schulz, R. (1999). Prevalence and impact of caregiving: A detailed comparison between dementia and nondementia caregivers. *The Gerontologist*, 39(2), 177-185. <https://doi.org/10.1093/geront/39.2.177>
- Pandharipande, P., Jackson, J., & Ely, E. W. (2005). Delirium: Acute cognitive dysfunction in the critically ill. *Current Opinion in Internal Medicine*, 4(5), 448-456. <https://doi.org/10.1097/01.ccx.0000170503.76528.4b>
- Parker, M. J., & Palmer, C. R. (1995). Prediction of rehabilitation after hip fracture. *Age and Ageing*, 24(2), 96-98. <https://doi.org/10.1093/ageing/24.2.96>
- Parker, M. J., Gillespie, W. J., & Gillespie, L. D. (2006). Effectiveness of hip protectors for preventing hip fractures in elderly people: systematic review. *BMJ*, 332(7541), 571-574. <https://doi.org/10.1136/bmj.38753.375324.7c>
- Pasco, J. A., Sanders, K. M., Hoekstra, F. M., Henry, M. J., Nicholson, G. C., & Kotowicz, M. A. (2005). The human cost of fracture. *Osteoporosis International*, 16(12), 2046-2052. <https://doi.org/10.1007/s00198-005-1997-y>
- Roche, J. J., Wenn, R. T., Sahota, O., & Moran, C. G. (2005). Effect of comorbidities and postoperative complications on mortality after hip fracture in elderly people: Prospective observational cohort study. *BMJ*, 331(7529), 1374. <https://doi.org/10.1136/bmj.38643.663843.55>
- Serban, A., & Tataru, S. (2018). The influence of general data protection regulation on patient engagement. *Logos Universality Mentality Education Novelty: Law*, 6(1), 56-72. <http://dx.doi.org/10.18662/lumenlaw/07>
- Stevenson, M. D., Davis, S. E., & Kanis, J. A. (2006). The hospitalisation costs and out-patient costs of fragility fractures. *Women's Health Medicine*, 3(4), 149-151. <https://doi.org/10.1383/wohm.2006.3.4.149>
- Sulkava, R., Wikström, J., Aromaa, A., Raitasalo, R., Lehtinen, V., Lahtela, K., & Palo, J. (1985). Prevalence of severe dementia in Finland. *Neurology*, 35(7), 1025-1029. <https://doi.org/10.1212/wnl.35.7.1025>

- Tomaziu-Todosia, M. (2019). The importance of public health policies in the social - economic development of Romania. *Postmodern Openings*, 10(2), 162-172.
<http://dx.doi.org/10.18662/po/78>
- Wiktorowicz, M. E., Goeree, R., Papaioannou, A., Adachi, J. D., & Papadimitropoulos, E. (2001). Economic implications of hip fracture: health service use, institutional care and cost in Canada. *Osteoporosis International*, 12(4), 271-278. <https://doi.org/10.1007/s001980170116>
- Willis, M. S. (2002). The health economics of calcium and vitamin D3 for the prevention of osteoporotic hip fractures in Sweden. *International Journal of Technology Assessment in Health Care*, 18(4), 791-807.
<https://doi.org/10.1017/s0266462302000600>