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ANALYSIS OF THE BUDGETARY IMPACT OF PRESSURE INJURY PREVENTION IN BEDRIDDEN ELDERLY

Dayane Ferreira de Castro[1,*], Alessandra Santos Portela[1,2], Kenia Oliveira Barbosa da Hora[1], Monique de Sousa Furtado[3], Sarah Lopes Silva Sodré[4], Glycia de Almeida Nogueira[5], Thyago Bernardo da Conceição[6], Bruna Dutra da Costa[3], Graziele Feliciano Cristino[7], Fábio Gonçalves Ferreira[8], Alcione Matos de Abreu[1], Roberto Carlos Lyra da Silva[1]

ABSTRACT

Objective: To analyze the budgetary impact and the increase in costs of the incorporation of special surfaces for pressure management to prevent pressure injuries in bedridden elderly patients. Method: Budget impact analysis, following the recommendations of the budget impact analysis methodological guideline. Two possible scenarios were out lined. In the first (alternative) scenario, the elderly receives a prevention strategy that includes the use of a viscoelastic mattress as a pressure distribution surface and a change in position with a minimum interval of 2 hours. In the second scenario (reference), the elderly receives a prevention strategy that only includes a change in position with a minimum interval of 2 hours. All costs were estimated using the macro costing technique. Results: The results of the analysis of the budget impact speak in disfavor, therefore, contrary to the eventual incorporation of the viscoelastic mattress as a complementary strategy to the systematic change of decubitus, of at least every 2 hours as a measure to prevent pressure injuries. Conclusion: The use of high technologies will not always be the differential for the best clinical outcome of the patient and it can result in more cost to the system.

DESCRIPTORS: Pressure ulcer. Analysis of the budgetary impact of therapeutic advances. Cost-benefit analysis. Nursing care. Enterostomal therapy.

ANÁLISE DO IMPACTO ORÇAMENTÁRIO DA PREVENÇÃO DE LESÃO POR PRESSÃO EM IDOSOS ACAMADOS

RESUMO

Objetivo: Analisar o impacto orçamentário e o incremento de custos da incorporação de superfícies especiais para o manejo da pressão para prevenção de lesão por pressão em pacientes idosos acamados. **Método:** Análise de impacto orçamentário, seguindo as recomendações da diretriz metodológica análise de impacto orçamentário. Delinearam-se dois possíveis cenários (referência e alternativo 1, 2 e 3). **Resultados:** O custo

1. Universidade Federal do Estado do Rio de Janeiro – Rio de Janeiro/RJ – Brazil.
2. Hospital Universitário Gaffrée e Guinle – Rio de Janeiro/RJ – Brazil.
3. Hospital Universitário Clementino Fraga Filho – Rio de Janeiro/RJ – Brazil.
4. Força Aérea Brasileira – Rio de Janeiro/RJ – Brazil.
5. Universidade Estácio de Sá – Rio de Janeiro/RJ – Brazil.
6. Hospital das Clínicas Mário Lioni – Duque de Caxias/RJ – Brazil.
7. Serviço Nacional de Aprendizagem Comercial – Rio de Janeiro/RJ – Brazil.
8. Hospital Universitário Pedro Ernesto – Rio de Janeiro/RJ – Brazil.
*Correspondence author: dayane.ferreiradecastro@hotmail.com
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em cinco anos no cenário de referência, adotando apenas a estratégia de mudança de decúbito, foi estimado em R$ 253.86,2542,81. Os custos nos cenários alternativos 1, 2 e 3 foram respectivamente, no mesmo período e com os ajustes econômicos, R$ 250.422.191,73, R$ 249.223.263,19 e R$ 248.029.130,37. **Conclusão:** A utilização de altas tecnologias nem sempre será o diferencial para o melhor desfecho clínico do paciente e poderá acarretar mais custo ao sistema.

DESCRITORES: Lesão por pressão. Análise de impacto orçamentário de avanços terapêuticos. Análise custo-benefício. Cuidados de enfermagem. Estomaterapia.

ANÁLISIS DEL IMPACTO PRESUPUESTARIO DE LA PREVENCIÓN DE LESIONES POR PRESIÓN EM ANCIANOS ENCAMADOS

RESUMEN

Objetivo: Analizar el impacto presupuestario y el incremento de costes de la incorporación de superfícies especiales para el manejo de la presión para la prevención de lesiones por presión em pacientes ancianos encamados. Método: Análisis de Impacto Presupuestario (AIO), siguiendo las recomendaciones de la Guía Metodológica de Análisis de Impacto Presupuestario. Se esbozaron dos escenarios posibles. Em el primer escenario (alternativo), las personas mayores recibe ecnologiategia de prevención que incluye el uso de um colchón viscoelástico ecnologiaficie de distribución de presiem y un cambio de poemión con un intervalo mínimo de 2 horas. Enel segundo escenario (referencia), los adultos mayore ecnologiana estrategia de prevención que solo incluye el cambio de posición conun intervalo mínimo de 2 horas. Todos los costos se estimaron utilizando la técnica de macro costos. Resultados: Los resultados del análisis de impacto presupuestario hablan desfavorablemente, por tanto, en contra de la eventual incorporación del colchón viscoe ecnologiamo estrategia complementaria al cambio sistemático de decúbito, de al menos cada 2 horas como medida de prevención de lesiones por presión. Conclusión: Se concluye que el ecnologiass tecnologías no siempre será el diferencial para el mejor desenlace clínico del paciente y que puede resultar em mayor costo para el sistema.

DESCRIPTORES: Úlcera por presión. Análisis de impacto presupuestario de avances terapéuticos. Análisis costo-beneficio. Atención de enfermería. Estomaterapia.

INTRODUCTION

The quality and safety of care provided in health services are essential attributes to meet the expectations and needs of their users and families. To achieve excellence in services, it is essential that the analysis of budgetary impact occurs as a tool to assist in decision making by considering the financial variations in the system after the adoption, withdrawal or modification of a strategy, intervention or technology in the context of health care and incorporated technologies[1].

Health economic analysis, like cost-effectiveness analysis and budget impact analysis (BIA), can be a good indicator of service quality, as it enables managers to assess whether health benefits justify operating costs and how feasible they are. Health economic evaluations seek to compare different health interventions, whose costs are expressed in monetary units and effects in clinical-epidemiological units (mortality, morbidity, hospitalization, adverse events, etc.)[2].

These analyses provide an overview of various types of care and their costs, effectiveness and efficiency. This study addresses the analysis of the budget impact of care for pressure ulcer (PU) prevention in bedridden elderly people.

The increased incidence of PU recorded in recent years is explained by the increased life expectancy of the population due to advances in health care. Studies evaluating the incidence of PU in hospitalized patients show higher prevalence in the elderly population[3].

Considering the high prevalence of PU and the increasing supply and demand for technologies for prevention and treatment, it is understood the importance of a budget impact estimate of the alternatives for the prevention of skin lesions analyzed here.

The objective of the study was to analyze the budgetary impact and cost increment of the incorporation of special surfaces for pressure management for PU prevention in bedridden elderly patients.

METHODS

This is a study of health technology assessment in the model of BIA, following the recommendations of the BIA methodological guideline. The mathematical modeling for the BIA was made from an adaptation of the *Brazilian Budget Impact Spreadsheet*[4].

It is a process of analysis of the clinical, economic and social consequences of the use of health technologies. Health technologies are understood as organizational systems, technical procedures and care protocols. Based on the investigation promoted by the health technology assessment method, the result provides subsidies for the decision of incorporation, monitoring and abandonment of technologies in use in health systems[2,4,5].

In the BIA model, the target population is elderly patients, aged 60 years or more, of both genders, bedridden and in need of long-term care, whose size estimate was made through the epidemiological method, consulting the Department of Informatics of the Unified Health System (Datasus). To estimate the size of the population that could benefit from the strategies analyzed, only the hospital admissions occurring in Brazil for Alzheimer's disease in 2020 were considered, given that it is one of the diseases of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) that will demand more long-term care, keeping the patient bedridden.

The analysis was performed from the perspective of the Unified Health System (UHS) at the federal level, which is why only direct costs were estimated using the macrocosting technique. Costs with health professionals will not be taken into account in any of the scenarios analyzed in the base case, since this is an economic analysis from the UHS perspective.

Only the average costs of hospital admission referring to the average length of stay of 22 days were considered, because, according to Datasus, in 2020, in UHS, 1,696 authorizations for hospital admission of patients diagnosed with Alzheimer's were approved, at a total cost of R$ 2,186,228.84, of which R$ 2,005,932.92 are related to exclusively hospital costs. The average cost per patient was R$ 1,803.82, with an average of 21.8 days of stay (days of hospitalization).

The time horizon was five years. The time frame took into account that, although Pus can develop in 24 hours or take up to 5 days to manifest and heal in 44 days on average, its costs and consequences may be short, medium, and long-term6.

In the model proposed for the BIA, the study problem begins with the need to adopt measures to promote skin care in elderly and bedridden patients in order to reduce the risks of PU development.

For this study, two possible scenarios for the base case were analyzed, named alternative scenario and reference scenario. In the first scenario (reference), only the costs related to hospitalization were considered. In this scenario, the elderly receives a prevention strategy that includes only the change of decubitus with a minimum interval of 2 h. In the second scenario (alternative), the elderly receives a prevention strategy that includes the use of the viscoelastic mattress as a pressure distribution surface and change of decubitus with a minimum interval of 2 h.

It is important to emphasize that the prevalence and incidence rates of Pus were estimated considering the information extracted from the results of published articles not necessarily related to national casuistry, due to the absence of reliable data on this casuistic in Brazil and in the UHS, such as mortality rates.

As for the costs of interventions, given the lack of information about the prices of cost items inherent to each of the actions of prevention, control, and treatment of PUs in the information systems of the Ministry of Health (UHS's Table

of Procedures, Medicines, Orthotics/Prostheses and Special Materials Management System and Health Price Database – SIGTAP), the acquisition price of one unit of viscoelastic mattress was estimated based on the prices practiced in the national market for individuals or companies, regardless of whether the sale was to the public or private sector. The useful life considered for the mattress was five years, and the average cost was estimated by dividing the acquisition price by the number of years of useful life.

The average costs with the treatment of stages 3 and 4 PUs were considered as possible avoided costs in the model. In the alternative scenario, only the average costs of one day of hospitalization, estimated based on information extracted from Datasus, were considered as costs in this scenario. In the alternative scenario, in addition to this cost item, the average annual cost of the viscoelastic mattress was also indicated. All costs were estimated by the macrocosting technique.

The durability and useful life of a viscoelastic mattress were arbitrarily defined as five years. Each patient should use the mattress for no more than 30 days, considering the average length of hospital stay of patients with Alzheimer's disease in the UHS. Therefore, to calculate the budgetary impact, the average annual cost of using the mattress in the alternative scenario per patient/day was considered.

RESULTS

Considering the price of the mattress R$ 2.311,25 and the average length of stay of 22 days per patient (hospitalization), throughout one year, 12 patients will be able to use the same mattress, dividing, therefore, the costs of its acquisition. Over five years, the useful life of the mattress and the temporal horizon of the analysis, 60 patients will have benefited from a viscoelastic mattress unit. Therefore, the cost of the mattress per patient during the hospital stay will be equal to the acquisition price (R$2,311.25) divided by the number of patients that will be able to use the mattress (60). The cost of the mattress per patient will be R$ 38.52.

As to the effectiveness of the interventions in the two scenarios analyzed in the base case, this was estimated by means of the probability of avoiding PU in each one of the scenarios, and the estimates were extracted from studies that included a population of bedridden elderly patients, regardless of the underlying disease or comorbidities.

Possible alternative scenarios for the use of the viscoelastic mattress were considered in the model:

- Alternative scenario 1: 50% of the patients will use the viscoelastic mattress;
- Alternative scenario 2: the percentage will be 75%;
- Alternative scenario 3: viscoelastic mattresses will be offered to all patients.

Economic adjustments were applied to the model, considering a discount rate of 3% and an inflation rate of 5% over the time horizon of the analysis. These are recommendations of the methodological guidelines for the development of health economic evaluation of the Brazilian Network for Health Technology Assessment4. Mid-cycle corrections will be applied to the model.

A 10% rate of demand induced by judicialization to meet the request of family members who sought protection in court was considered in the model. No condition of restriction of use or costs associated with the use of the strategies in the scenarios analyzed in the model was taken into account.

The values for the variables cost, effectiveness and probabilities assumed as assumptions in the BIA model are summarized in Table 1.

It was also necessary to consult electronic and online databases of information about health prices, so that it was possible to estimate the costs of each of the strategies analyzed in the BIA, by pricing each of the items that compose them.

Price estimates for cost items of each of the interventions analyzed were made by consulting Brasíndice, the Electronic System of Information to the Citizen (e-SIC) and SIGTAP. Researches in the Health Price Database and searches for price taking and purchasing records were also conducted.

Table 1. Estimates of the values of the variables imputed in the model under analysis. Rio de Janeiro (RJ), Brazil, 2021.

Scenarios	Variables	Frequency	Reference/calculation rationale	Estimates
Reference scenario	Target population	Annual	Método epidemiológico Datasus (2020)[7]	1,696
	Incidence of Alzheimer's	Annual	Boff et al. (2015)[8]	5.1 to 17.5% (mean = 11.3%)
	Alzheimer's disease mortality rate	Annual	Datasus (2020)[7]	5.63%
	Average cost of hospitalization	Daily (AHA)	Datasus (2020)[7]	R$ 1,803.82
	Cost of PU treatment	Biannual	Donoso et al. (2019)[9]	R$ 51,014
	Effectiveness in PU prevention in the setting	12 weeks	van Leen et al. (2018)[10]	95.2% 5/103 PUs/patients
	Average length of stay	Days	Datasus (2020)[7]	22 dias
	Average total cost of the scenario	Monthly	Average cost of 22 days of hospitalization	R$ 1,803.82
Alternative scenario	Target population	Annual	Datasus epidemiological method (2020)[7]	1,696
	Incidence of Alzheimer's	Annual	Boff et al. (2015)[8]	5.1 to 17.5% (mean = 11.3%)
	Alzheimer's disease mortality rate		Datasus (2020)[7]	5.63
	Average cost of hospitalization	Daily (AHA)	Datasus (2020)[7]	R$ 1,803.82
	Cost of PU treatment	Biannual	Donoso et al. (2019)[9]	R$ 51,014
	Prevalence rate of Pus	Biannual	Carvalho et al. (2019)[11]	2.2 to 23.9%
	Effectiveness in PU prevention in the scenario	12 weeks	van Leen et al. (2018)[10]	91.3% 9/103 PUs/patients
	Average cost of viscoelastic mattress per patient	Unit 22 days of use	Price of the mattress divided by 60 patients	R$ 38.52
	Average total cost of the scenario	Monthly	Average hospitalization cost (22 days) + average cost of viscoelastic mattress per patient	R$ 1,842.34

AHA: authorization for hospital admission.

The maximum and minimum values were determined in the base case, considering the variation and averages of all prices of viscoelastic mattress brands found for sale in the domestic market.

The cost of the strategy used in the alternative scenario (viscoelastic mattress) was estimated at R$ 1,842.34, calculated by adding the costs estimated in the reference scenario (R$ 1,803.82), plus the average cost per patient of the use of the viscoelastic mattress during the hospital admission/length of stay in the hospital (R$ 38.52). In the reference scenario, only the costs related to the hospital admission were considered.

The avoided costs associated with the strategy used in the alternative scenario were taken into account, considering the costs with the treatment of stages 3 and 4 PUs, the minimum of six months of treatment and wound management and the need to perform at least one dressing daily (R$ 51,014).

The results of the BIA speak against, therefore, the possible incorporation of the viscoelastic mattress as a complementary strategy to the systematic decubitus change of at least every 2 hours as a prevention measure for PU.

Table 2 shows the evolution of average monthly costs over five years in the base case with economic adjustments (annual inflation rate of 4.5% in the first year and 5% in subsequent years). The discount rate was 3% annually.

Table 2. Evolution of average costs in the scenarios analyzed in the base case in five years, according to economic adjustments. Rio de Janeiro (RJ), Brazil, 2021.

Year	Without inflation adjustment (R$)	Inflation-adjusted (R$)	Considering discounts (R$)	Inflation-adjusted and with discounts (R$)
Reference scenario				
Cost year 1	22,107.62	22.107.62	22.107.62	22,107.62
Cost year 2	22,107.62	23.106.88	21.444.39	22,443.65
Cost year 3	22,107.62	24.262.23	20.801.06	22,892.53
Cost year 4	22,107.62	25.475.34	20.177.03	23,350.38
Cost year 5	22,107.62	26.749.10	19.571.72	23,817.38
Alternative scenario 1				
Cost year 1	21,923.18	21,923.18	21,923.18	21,923.18
Cost year 2	21,911.63	22,902.03	21,254.28	22,214.97
Cost year 3	21,900.07	24,034.45	20,605.78	22,614.02
Cost year 4	21,888.52	25,222.86	19,977.06	23,020.22
Cost year 5	21,876.96	26,470.02	19,367.52	23,433.72
Alternative scenario 2				
Cost year 1	21,830.74	21,830.74	21,830.74	21,830.74
Cost year 2	21,813.40	22,799.37	21,159.00	22,115.39
Cost year 3	21,796.07	23,920.31	20,507.92	22,506.62
Cost year 4	21,778.73	25,096.35	19,876.86	22,904.76
Cost year 5	21,761.40	26,330.20	19,265.21	23,309.94
Alternative scenario 3				
Cost year 1	21,738.66	21,738.66	21,738.66	21,738.66
Cost year 2	21,715.57	22,697.11	21,064.10	22,016.20
Cost year 3	21,692.48	23,806.63	20,410.45	22,399.66
Cost year 4	21,669.39	24,970.35	19,777.07	22,789.77
Cost year 5	21,646.30	26,190.94	19,163.32	23,186.65

Source: BIA result.

The cost in five years in the reference scenario, therefore, adopting only the strategy of changing the patient's decubitus at least every 2 h, depending on the patient's condition and risk of developing PUs, was estimated at R$ 253.86,2542,81, to serve a total of 11,039 bedridden Alzheimer's disease patients in the UHS who will eventually develop PU and, therefore, require daily changes of dressings. The costs in alternative scenarios 1, 2 and 3 were respectively, in the same period and with the economic adjustments, of R$ 250,422,191.73, R$ 249,223,263.19 and R$ 248,029,130.37. These costs considered the economic adjustments for inflation and discount rate.

The incremental or differential budgetary impact reports the additional cost of incorporating the viscoelastic mattress as an alternative strategy for reducing the risk and rates of PU in bedridden elderly patients in the base case, compared with not using this pressure-distributing technology in the baseline scenario.

As in the base case, the incorporation of the viscoelastic mattress as a complementary strategy to decubitus changes did not result in money saving, but in increment. In alternative scenario 1, the use of the viscoelastic mattress, restricted to only 50% of the patients, resulted in a budget impact of 16% in five years, which would represent an incremental cost of more than R$ 41,518,717.81 in relation to the baseline scenario, considering the avoided costs. If avoided costs were not considered, the incremental cost would be R$ 3,164,051.08.

In alternative scenario 2, the incremental cost in five years was R$ 62,661,173.72, which would represent an impact of 25% in relation to the reference scenario, considering the avoided costs. If avoided costs were not considered, the incremental cost would be R$ 4,362,979.62.

Finally, in alternative scenario 3, in which all the patients would be using the viscoelastic mattress, the incremental cost in five years, also including the avoided costs, was R$ 83,719,059.80, representing a budgetary impact of 33% in relation to the reference scenario. If avoided costs were not considered, the incremental cost would be R$ 5,557,112.45.

The results of the BIA under each of the alternative scenarios compared to the baseline scenario, without considering avoided costs, are summarized in Table 3.

Table 3. Incremental budgetary impact by offering viscoelastic mattress for 50, 75, and 100% of the patients in the base case and without considering the avoided costs. Rio de Janeiro (RJ), Brazil, 2021.

Scenario 1 vs. reference scenario (R$)		Difference (%)
Year 1	–363.588,94	–0,83
Year 2	–476.378,31	–1,02
Year 3	–613.075,70	–1,22
Year 4	–767.967	–1,41
Year 5	–943.041,14	–1,61
In five years	**–3.164.051,08**	**–1,25**
Scenario 2 vs. reference scenario (R$)		**Difference (%)**
Year 1	–545.839,03	–1,25
Year 2	–683.831,22	–1,46
Year 3	–849.480,27	–1,69
Year 4	–1.036.532,18	–1,91
Year 5	–1.247.296,92	–2,13
In five years	**–4.362.979,62**	**–1,72**
Scenario 3 vs. reference scenario (R$)		**Difference (%)**
Year 1	–727.360,12	–1,7
Year 2	–890.454,33	–1,9
Year 3	–1.084.939,22	–2,2
Year 4	–1.304.023,10	–2,4
Year 5	–1.550.335,68	–2,6
In five years	**–5.557.112,45**	**–2,19**

Source: result of BIA using the Brazilian Budget Impact Spreadsheet.

The results of the BIA in each of the scenarios, considering the avoided costs, are summarized in Table 4.

Table 4. Incremental budgetary impact of offering viscoelastic mattress for 50, 75 and 100% of patients in the base case and with avoided costs. Rio de Janeiro (RJ), Brazil, 2021.

Scenario 1 vs. reference scenario (R$)		Difference (%)
Year 1	6,428,674,79	14,75
Year 2	7,255,167,29	15,52
Year 3	8,197,466,72	16,27
Year 4	9,241,166,52	17,01
Year 5	R$10,396,242,48	17,76
In five years	**41,518,717,81**	**16,37**
Scenario 2 vs. reference scenario (R$)		**Difference (%)**
Year 1	9,642,556,56	22,12
Year 2	10,913,487,18	23,34
Year 3	12,366,333,35	24,54
Year 4	13,977,168,11	25,73
Year 5	15,761,628,52	26,92
In five years	**62,661,173,72**	**24,71**
Scenario 3 vs. reference scenario (R$)		**Difference (%)**
Year 1	12,843,582,81	29,47
Year 2	14,557,173,78	31,14
Year 3	16,518,524,52	32,78
Year 4	18,694,225,68	34,42
Year 5	21,105,553,00	36,05
In five years	**83,719,059,80**	**33,01**

Source: result of BIA using the Brazilian Budget Impact Spreadsheet.

DISCUSSION

Pressure ulcers present a great challenge for healthcare professionals and institutions, since in clinical practice the treatment of PUs represents increased costs, prolonged hospitalization, in addition to the impact on the quality of life of patients and the care provided[11,12].

Pressure ulcers are the third most reported event by the Center for Patient Safety in Brazilian hospitals, being characterized as an indicator in the quality of care, since the higher the occurrence of adverse events the worse the quality of care provided[11].

The high cost of treatment, as well as its prevention, becomes worrisome, since demographic data show the aging of the Brazilian population, a public with risk factors for PUs during a hospital stay[3,6].

The budgetary analysis of the treatment and means of prevention should be considered, since financial resources will be better allocated, favoring the quality of care provided.

The use of preventive protocols decreases the incidence of PUs and, consequently, the expenses[12].

Simple measures, such as maintaining skin integrity through adequate hygiene, moisture-free skin, moisturizing with natural oils, using disposable diapers optimally, avoiding folds in the sheets, changing decubitus and controlling excess weight on bony prominences, are effective in prevention[11].

These studies corroborate the result found in the BIA performed in this study, reaffirming that only incorporating high-cost technologies will not always be the differential for the best clinical outcome of the patient.

Considering the technology used in the BIA, the incorporation of the viscoelastic mattress as a complementary strategy to decubitus changes did not result in money saving, but in increment.

It is possible to treat inpatient injuries with few supplies and resources in the same time required to close an injury using a rich variety of resources and supplies[11].

Nursing interventions in patient skin care and mobilization through skin rounds and health education are essential for reducing hospital-acquired PUs and, consequently, the budgetary impact on the treatment of this complication[12-14].

It is understood that intervention, including preventive care, in the treatment of PUs is essential for decision making, and multiprofessional intervention is a starting point for the creation of appropriate public health policies[12-14].

Nursing care based on systematic change of decubitus and skin care measures can make a difference[13].

It is noteworthy that this research presented some limitations to the study. The results found here by the budget impact model should be used with caution, since they incorporate data that do not allude to the Brazilian reality, especially regarding the effectiveness of the use of the viscoelastic mattress that served as a reference to estimate the costs avoided with the use of this technology. However, the data treated can and should be used as guidelines for decision making by professionals and health institutions. Another limiting factor was the small sample size found in primary studies, being necessary to underestimate the sample to ensure the statistical power expected in the study, small to be able to identify the difference in effect size previously determined in the protocol of that study.

It is possible to define that the most significant impact of the model was the effectiveness of the viscoelastic mattress, which proved to be much lower than the strategy of using only systematic decubitus change. The study used to estimate this effectiveness was the only one available that directly evaluated the strategies compared in the BIA model.

The incidence rates of the disease imputed to the model, as well as the mortality rate associated with Alzheimer's disease, did not allow further exploration of the treatment of the data found, since it reflects data from a single year (2020), and not an average of at least three years to actually determine the prevalence of cases of PU in these patients.

Finally, as a limitation of the study, the costs imputed in the model related to wound treatment only considered the deepest and most advanced lesions, from the point of view of their staging, as well as the costs for the acquisition of the viscoelastic mattress, because the baseline studies only provided these data, and there was no cost analysis of the treatment of each staging of PU or the mode of treatment and prevention.

CONCLUSION

The treatment of PUs is costly and burdensome to healthcare institutions. Preventive measures, when possible, should be optimized, resulting in savings for the institution[15,16].

This study achieved its objective by clarifying that, in the base case, the incorporation of the viscoelastic mattress as a complementary strategy to decubitus changes did not result in money saving, but in increment.

The results of this study suggest that the use of the viscoelastic mattress, as an isolated measure for the prevention of PU, can lead to higher costs to the system, deconstructing the idea that high technologies are the most effective and capable of saving financial resources in the medium and long term.

The identification of these factors provides a better choice in the performance of individualized nursing care, leading to clinical improvement of the patient and the reduction of health expenses, with preventive measures being carried out more quickly and effectively in the population at risk[11,17].

This was a first experience addressing such an important topic for managers, UHS and health professionals, using as methodological approach the economic, cost-effectiveness analysis.

Health technology assessment and economic analysis are of utmost importance to efficiently support the management of health technologies and the efficient allocation of available resources in the public health system.

AUTHORS' CONTRIBUTIONS

Substantive scientific and intellectual contributions to the study: Castro DF, Silva RCL and Ferreira FG; Conception and design: Castro DF, Silva RCL and Cristino GF; Data collection, analysis and interpretation: Castro DF, Silva RCL, Portela AS, Abreu AM and Conceição TB; Writing of the article: Castro DF, Silva RCL, Nogueira GAN and Costa BD; Critical revision: Silva RCL, Hora KOB, Furtado MS and Sodré SLL; Final approval: Castro DF, Silva RCL, Portela AS, Hora KOB, Furtado MS, Sodré SLS, Nogueira GA, Conceição TB, Costa BD, Cristino GF, Ferreira FG and Abreu AM.

AVAILABILITY OF RESEARCH DATA

Data will be made available upon request.

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