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The cost of pressure ulcer prevention and treatment in hospitals and nursing homes in Flanders: A cost-of-illness study

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ABSTRACT

Introduction: The economic impact of pressure ulcer prevention and treatment is high. The results of cost-of-illness studies can assist the planning, allocation, and priority setting of healthcare expenditures to improve the implementation of preventive measures. Data on the cost of current practice of pressure ulcer prevention or treatment in Flanders, a region of Belgium, is lacking.
Aim: To examine the cost of pressure ulcer prevention and treatment in an adult population in hospitals and nursing homes from the healthcare payer perspective.
Design: A cost-of-illness study was performed using a bottom-up approach.
Settings: Hospitals and nursing homes in Flanders, a region of Belgium.
Methods: Data were collected in a series of prospective multicentre cross-sectional studies between 2008 and 2013. Data collection included data on risk assessment, pressure ulcer prevalence, preventive measures, unit cost of materials for prevention and treatment, nursing time measurements for activities related to pressure ulcer prevention and treatment, and nursing wages. The cost of pressure ulcer prevention and treatment in hospitals and nursing homes was calculated as annual cost for Flanders, per patient, and per patient per day.
Results: The mean (SD) cost for pressure ulcer prevention was €7.88 (8.21) per hospitalised patient at risk per day and €2.15 (3.10) per nursing home resident at risk per day. The mean (SD) cost of pressure ulcer prevention for patients and residents identified as not at risk for pressure ulcer development was €1.44 (4.26) per day in hospitals and €0.50 (1.61) per day in nursing homes. The main cost driver was the cost of labour, responsible for 79–85% of the cost of prevention. The mean (SD) cost of local treatment per patient per day varied between €2.34 (1.14) and €77.36 (35.95) in hospitals, and between €2.42 (1.15) and €16.18 (4.93) in nursing homes.
Conclusions: Related to methodological differences between studies, the cost of pressure ulcer prevention and treatment in hospitals and nursing homes in Flanders was found to be low compared to other international studies. Recommendations specific to pressure ulcer prevention are needed as part of methodological guidelines to conduct cost-of-illness studies.

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What is already known about the topic?

- The cost of pressure ulcer prevention and treatment has an important impact on national health care expenditures.
- The cost of pressure ulcer prevention and treatment varies between studies, and is related to differences in study methodologies.
- Cost-of-illness studies can help the identification of the cost drivers for pressure ulcer prevention and treatment, and guide the decision making about allocating healthcare resources.

What this paper adds

- The cost for pressure ulcer prevention per patient/resident per day was higher in hospitals compared to nursing homes.
- Cost of labour was the main cost driver of pressure ulcer prevention, responsible for 79–85% of the total cost.
- Reliable risk assessment policy and continuous monitoring and adoption of preventive measures may decrease healthcare expenditures by lowering the costs of prevention for patients not at risk and cost of treatment.

1. Introduction

Pressure ulcers are defined as localised injuries of the skin and/or underlying tissue over a bony prominence due to pressure and shear (NPUAP & EPUAP, 2009). Pressure ulcers are internationally considered as an important quality indicator, and most pressure ulcers are avoidable (National Pressure Ulcer Advisory Panel, 2011; Van Den Bos et al., 2011). In addition to the impact on the physical, psychological, and social well-being of patients, pressure ulcers have financial implications for all involved parties (Gorecki et al., 2009; Hopkins et al., 2006; Langemo et al., 2000; National Institute for Clinical Excellence, 2005; Spetz et al., 2013). The costs of pressure ulcers are receiving increased attention because of limited public and healthcare budgets. Furthermore, insight is needed as to costs related to the treatment of mainly avoidable events, such as pressure ulcers. Health economics is the discipline that deals with the application of economic principles to health and the healthcare sector (Annemans, 2008). Different approaches in health economics can be used, such as health economic evaluations, and cost of illness/injury studies. The former approach can be defined as a comparative analysis of both the costs and health effects of two or more alternative health interventions. The latter method can be defined as a calculation of the economic burden of an injury or illness by quantifying the (direct) medical costs (Hodgson and Meiners, 1982). Although the relevance of cost-of-illness studies has been questioned because the variation in methodology leads to inconsistent cost estimates, and a lack of information on effectiveness of the included treatments, these studies can aid our understanding of the importance of health problems and provide information on the impact of prevention and treatment of an illness on the total healthcare budget (Akobundu et al., 2006; Larg and Moss, 2011). Furthermore, these insights can help policymakers and health service management to identify the cost drivers for pressure ulcer prevention and treatment and guide decision making about allocating healthcare resources, such as materials and nursing staff.

The perspective of an economic study reflects who is paying the costs. Different health economic perspectives can be identified, such as the societal, governmental, organisational or institutional, insurer, or patient perspective. The choice of perspective is related to the research goal and the disease under study, but the available cost data may influence the chosen perspective (Larg & Moss, 2011). The broader the perspective, the less chance there is that cost shift between sectors will affect the outcome, thereby minimising the potential biases of more narrow views (Byford & Raftery, 1998; Cleemput et al., 2008; Larg and Moss, 2011). The results of cost-of-illness studies are subject to uncertainty, such as the lifetime of materials, prevalence figures, or labour costs. This uncertainty can be handled by sensitivity analyses that examine the influence of possible variances in prevalence, labour cost, or material cost.

A recent systematic review pointed out that the cost of pressure ulcer prevention per patient per day varied between €15.70 and €87.57 across all types of health care settings. The mean costs of pressure ulcer treatment ranged between €1.71 and €470.49 per patient per day across all types of health care settings (Demarré et al., 2015). The costs of pressure ulcer prevention and treatment are driven by labour, prolonged hospitalisation, complications due to pressure ulcers, and material cost. The cost of nursing labour was found high compared to the cost of materials (Dealey et al., 2012; Frantz et al., 2001; Xakellis et al., 2001). Nursing time related to activities for treatment of prevention of pressure ulcers varies as a result of the methodology used to measure these times. This variation in study methodology influences the mean cost of pressure ulcer prevention and treatment. Several studies used subjective time measurements, such as expert opinion or a Delphi method, to calculate the duration of nursing activities related to pressure ulcer prevention and treatment (Agreda et al., 2007; Alterescu, 1989; Assadian et al., 2011; Bayoumi et al., 2008; Bennett et al., 2004; Dealey et al., 2012; Foglia et al., 2012; Hale, 1990; Schuurman et al., 2009; Severens et al., 2002). Nursing time measured through direct observation was found to result in lower times compared to using a Delphi method (Boudt, 2013; Burke et al., 2000). The method of direct observation requires a researcher to observe a person for a period of time and uses a chronometer to measure length of time of the activities. This method most accurately measures the time spent on an activity related to pressure ulcer prevention and treatment (Burke et al., 2000). Unfortunately, a set of accurate chronometer measurements of nursing time is currently lacking, although it could be used in future cost-of-illness studies, thereby increasing the quality of data collected.

Most of the previously conducted studies on cost of pressure ulcer prevention have calculated the cost of preventive measures based on models or algorithms of prevention which were created from best practice guidelines, or based on findings from the literature