UNIVERSITY OF TEXAS ARLINGTON | COLLEGE OF NURSING AND HEALTH INNOVATION

Cost Analysis of Hospital-Acquired Infections (HAIs) Intervention: A Nursing Perspective

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Abstract

- Cost analysis is a systematic process of collecting, categorizing, and analyzing cost related to a health problem or an intervention and its outcomes for purposes of making decisions (CDC, 2013).
- This presentation is a review of a meta-analysis of HAIs, the financial implications of HAIs in the United States, and a comparison of the methodology used with standard methods of cost analyses.

Methods of Cost Analysis

- Cost of Illness analysis
- Determining economic impact of illness, associated intervention in a population
- (e.g. cost of HAIs in West Texas)

Methods of Cost Analysis

- Cost effectiveness analysis (CEA)
  - Comparison of monetary cost with nonmonetary intervention outcomes
  - E.g. reduced mortality and morbidity
- Cost Benefits Analysis (CBA)
  - Comparison of cost with outcomes in monetary terms

Economic Analysis

Type of Economic Analysis	Cost Valuation	Comparison	Outcome Valuation
Cost of Illness	Monetary (e.g. $)	Vs	None
Cost Effectiveness	Monetary (e.g. $)	÷	None monetary e.g. Health outcomes
Cost Benefit	Monetary (e.g. $)	÷ (cost benefit ratio) or – (net of cost and benefit	Monetary (e.g. $)

Justification for HAIs Intervention Economic Analysis

- Five major HAIs cost 9.8 billion between 2011 and 2013 (Zimlichman et al., 2013)
- HAIs represent major client safety threats
- Alarming cost burden to clients, families
- HAIs as sources of high nurse-client ratio, high nursing care burden
- Health care cost data collection for:
- Clinical studies, administrative claims, payments

Background Information about HAIs

- HAIs; infections during health intervention (CDC, 2016)
- HAIs, significant threat to patient safety, public health problem (CDC, 2016)
- About 1 in 25 hospital patients has at least one HAI
- Significant cause of morbidity and mortality

(CDC, 2015; Healthy People 2020, 2014)

Increased cost of care by $10,375, 3.30 extended hospital days per HAI (Hassan, Tuckman, Patrick, Kountz, and Kohn (2010)

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National HAIs Intervention Strategies

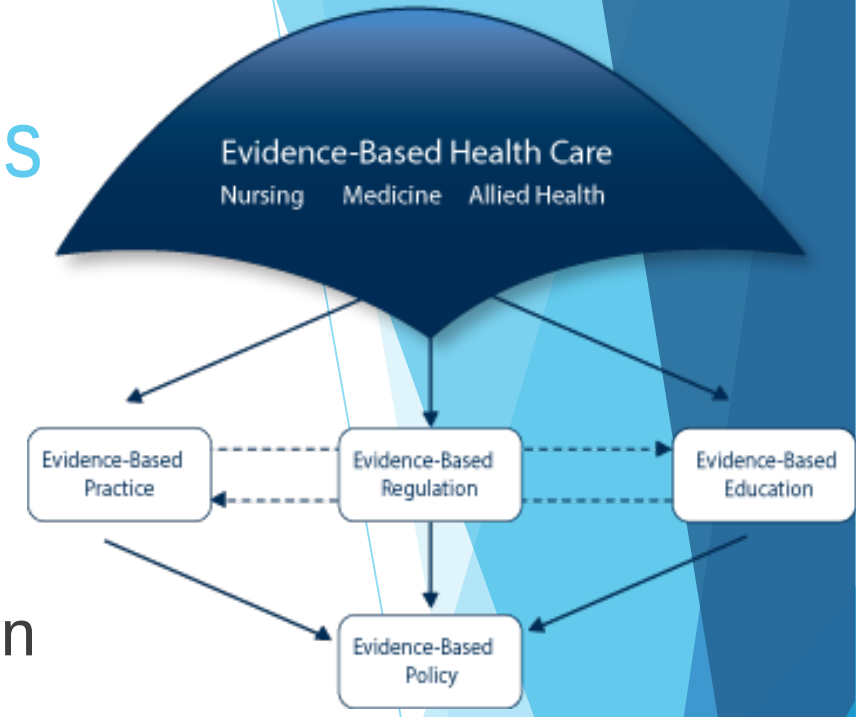
- 2008 HHS Steering Committee for the prevention of HAIs
- Strategies
- Action plan for the prevention of HAI (CDC, 2015)
- Infection control assessment tools, targeted assessment for prevention
- Prevention toolkits, basic infection control and prevention methods
- Protection of healthcare personnel (CDC, 2015)

National HAIs Intervention Outcomes

- The hospital readmission reduction program
- The hospital-acquired condition (HAC) reduction program
- Intervention Outcomes
- 2011-2014; 50% reduction in central line-associated blood infections
- 2008-2014; 17% decrease in surgical site infections, 17% decrease in abdominal hysterectomy-related infections

(CDC, 2016)

National HAIs Intervention Outcomes



- 2011-2014; 13% decreased hospital-onset methicillin difficile infections
- 8% fall in hospital-onset Clostridium difficile infections (CDI)
- Despite the reduction in some HAIs, more work needs to be done

(CDC, 2016)

A Met-analysis of HAIs in the US

- 3-step method meta-analysis of the cost of HAIs
- Step 1; estimated epidemiological and economic outcomes, incidence rates
- Attributable costs, added length of hospital stay (LOS)
- Step 2; modeled variation of step 1 outcomes within a large patient population.
- Step 3; Monte Carlo simulated generated point estimates and 95% CIs for:
- attributable costs, LOS

(Zimlichman et al., (2013)

A Met-analysis of HAIs in the US

- Computation of financial impact of the 5 most significant HAIs
- Surgical site infections (SSI), central line-associated bloodstream infections (CLABSI)
- Catheter-associated urinary tract infections (CAUTI),
- Ventilator-associated pneumonia (VAP), clostridium defficile infection (CDI)
- Analysis of the 2009 National In-patient Sample (NIS) of the Health Care Utilization Project (HCUP)

A Met-analysis of HAIs in the US Findings

- CLABSI found to be most costly HAI at $ 45, 814, accounting for 15.7 excess LOS
- Costs of SSI was at $20, 785, CDI at $11, 285, and CAUTI at $896.
- The total annual costs for the 5 significant infections were $9.8 billion.
- SSI contributed the most to overall costs (33.7%)
- VAP (31.6%), CLABSI (18.9%), CDI (15.4%), CAUTI (<1%)

(Zimlichman et al., 2013)

Evaluation of the Methodology for Cost Analysis of HAIs

- Methodology satisfactory, systematic approach to HAIs cost analysis
- Estimation of social and financial implications on the healthcare system (CDC, 2016)
- The meta-analysis mainly relied on LOS and cost of direct treatment
- Did not factor in indirect costs such as staff benefits for excess LOS

Evaluation of the Methodology for Cost Analysis of HAIs

- Missing cost of intangibles; staff training, campaigns meant to reduce HAIs
- Lack of data on causes of HAIs, the benefits of lowering HAIs and interventions needed to reduce HAIs.

Linkages and Nursing Perspectives

- As a nurse and student of health policy, I am developing a research proposal to conduct an economic analysis of the five most common HAIs using the CBA, and Cost-effectiveness (CEA) approaches as guidelines
- CEA is a tool used to guide health care decision making regarding choices of medical care to be offered (US Department of Veterans Affairs, 2018).

Linkages and Nursing Perspectives

- The primary purpose of a CBA analysis is to help social decision making and rationalize health policy decisions

(Boardman, Greenberg, Vining, & Weimer, 2017)

- Unlike CEA, a CBA usually identifies the benefits of an intervention as well as its cost, and places a monetary value on any benefits identified

Conclusion

- Zimlichman et al., (2013) followed a systematic process of data collection
- Findings were significant for informed policy decision making
- Vital elements of CBA and CEA were not addressed such as indirect cost and benefits of HAIs reduction

Conclusion

- Though the substantive matter of nursing is to prevent illness, promote health, and alleviate pain, we are also duty bound to ensure health care is safe, effective, and affordable
- Nurses need to show interest in policy decisions that affect the profession and patients. A holistic nursing economic analysis should include elements of both CEA and CBA.

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