Improving Hand Hygiene Behavior – The Effects of Social Influence and Leadership

Dr. Anita Huis, Radboud University Nijmegen Medical Centre, The Netherlands

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Hosted by Dr. Hugo Sax, University Hospital of Zurich

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July 25, 2013

Outline 1

• The burden of Hospital Acquired Infections (HAIs)
• Implementation of change
• Effective hand hygiene (HH) strategies
• The development of 2 HH strategies
• Compare both strategies on effectiveness

Outline 2

• Economic evaluation: is a team and leaders-directed strategy cost-effective?
• Integrating process and outcome evaluations: explaining the effects
• The team and leaders-directed strategy in a multidisciplinary setting
• Future directions

The burden of HAIs

• Annually 100,000 HAIs in the Netherlands
• Prevalence rate of 7.2% in hospital wards in the Netherlands
• One thousand cases of excess mortality per year
• Estimated costs by prolonged hospital stay: € 337 million annually (1.7% of total hospital costs)

Simple and effective

Hand hygiene (HH) is the most important measure to reduce HAIs

‘The treatment effect is so great that if hand hygiene were a new drug it would be used by all’

Stone 2001
But not that simple at all!

In the Netherlands, HH is performed in only 19.5% of the relevant opportunities.

Implementation problem

- Innovations do not implement themselves
- Specific programs are required to implement innovations
- Implementation activities require a systematic approach and good planning

Barriers

<table>
<thead>
<tr>
<th>Factor of Barrier</th>
<th>Difficulties to change</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognition</td>
<td>Self-clean procedures</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td>Lack of hand hygiene</td>
<td>35%</td>
</tr>
<tr>
<td></td>
<td>Inconvenience</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>Lack of facilities</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Social</td>
<td>15%</td>
</tr>
<tr>
<td></td>
<td>Organizational</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Resources</td>
<td>5%</td>
</tr>
</tbody>
</table>

Effectiveness HH strategies

<table>
<thead>
<tr>
<th>No. of studies</th>
<th>Mostly effective</th>
<th>Mostly ineffective</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Performance feedback</td>
<td>Education</td>
</tr>
<tr>
<td></td>
<td>Improved policies</td>
<td>Improved facilities</td>
</tr>
<tr>
<td></td>
<td>Improved facilities</td>
<td>Patient involvement</td>
</tr>
<tr>
<td></td>
<td>Social influence</td>
<td></td>
</tr>
</tbody>
</table>

Adapted from Van der Helst et al., 2006.

Effectiveness HH strategies (cont.)

Changing HH behavior

1. Characterize important targets
2. Plan contact and topics
3. Identify key roles and responsibilities
4. Develop a communication strategy
5. Implement and monitor the intervention
6. Evaluate and modify the intervention

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Something is missing
Barriers at team level not addressed!
- Social norm is lacking
- Social support and ‘model behavior’ is lacking
- Ward management is not interested in HH
- Insight into team performance is lacking

Theories on behavior change
- Social learning theory (Bandura 1986)
- Example behavior and reinforcement of correct behavior
- Social influence theory (Mittman 1992)
- Social norm determines what correct behavior is
- Theory on team effectiveness (West 1990; Shortell 2004)
- Orientation on team climate and willingness to change
- Theory of leadership (Øvretveit 2004)
- Active participation of the ward management

Review
A systematic review of hand hygiene improvement strategies: a behavioural approach
Anita Huis, Theo van Achtenberg, Barji de Bruin, Richard Card, Lotte Schoenhoven, and Maltese Hüscher

Building 2 HH strategies
- Literature based state-of-the-art strategy
- Theory based team and leaders-directed strategy

State-of-the-art strategy
- Education and instruction
- Reminders
- Performance feedback
- Organizational
- Products
- Facilities

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Hospital wide campaign

• Hand hygiene promotion meetings
• Leaflets (HH indications, instruction)
• Adequate products and facilities
• Website, including hand hygiene quiz
• Posters (awareness)
• Performance feedback

Team and leaders-directed strategy

• Setting norms and targets within the team
• Social influence, role modeling
• Measuring compliance, problem analysis and improvement
• Active commitment/participation in performance improvement initiatives of ward manager

Improving team performance 1

Norm setting and goal setting regarding HH
• Three interactive team sessions
• Analysis of barriers and facilitators
• Defining improvement activities
• Nurses address each other in case of undesirable hand hygiene behaviour

Improving team performance 2

Modeling by informal leaders at the ward
• Informal leaders demonstrate good hand hygiene behavior
• Informal leaders model social skills in addressing behavior of colleagues
• Informal leaders instruct and stimulate their colleagues in providing good hand hygiene behavior

Improving team performance 3

Gaining active commitment of ward manager
• Ward manager designates hand hygiene as a priority
• Ward manager actively supports team members and informal leaders
• Ward manager discusses hand hygiene compliance rates with team members

Compare effectiveness

Impact of a team and leaders-directed strategy to improve nurses’ adherence to hand hygiene guidelines: A cluster (randomised trial)
Anika Huis", Lisette Schorsbroeke, Richard Geel", Regier Deenders", Marijke Hulscher", Ilse van Achtenberg*

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Outcome measures

Primary
• Compliance with hand hygiene guidelines
  • The percentage of nurses’ actions in line with hand hygiene guidelines in case of an opportunity to perform this action

Secondary
• The presence of jewelry (ring, watch or other jewelry), and long-sleeved clothes
  • Compliance with specific type of hand hygiene opportunity representing the required moments for hand hygiene

Data collection

Direct unobtrusive observations
• At point of care
• ± 60 Observations per ward involving 15 nurses
• Observations introduced as research on medication and other patient safety errors
• 10,785 opportunities for hand hygiene in 2733 nurses

Score form

Statistical methods

• Intention-to-treat
• Multilevel logistic analysis
  • Adjusted for clustering of data
• Random factors
  • Nurse and nursing ward
• Fixed factors
  • Strategy, timing of measurement, ward’s HH compliance at baseline

Effects on HH compliance

Baseline

State of the art
New strategy

Post test 1

State of the art
New strategy

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Economic evaluation

Cost-effectiveness of a team and leaders-directed strategy to improve nurses’ adherence to hand hygiene guidelines: A cluster randomised trial


*International Institute for Nursing Studies, Radboud University Nijmegen Medical Centre, Nijmegen, The Netherlands
**Department of Health Care Management, Radboud University Nijmegen Medical Centre, Nijmegen, The Netherlands
†Faculty of Health Sciences, University of Amsterdam, Amsterdam, The Netherlands

Limited resources force us to choose the most cost-effective strategy
No well-designed economic evaluations of hand hygiene improvement strategies available
AIM – to determine whether the additional increase in hand hygiene compliance due to the team and leaders-directed strategy justifies the additional costs

Cost-effectiveness

Two incremental cost-effectiveness ratios:
1. The incremental cost-effectiveness ratio per extra percentage of hand hygiene compliance gained
2. The incremental cost-effectiveness ratio per additional percentage reduction in the HAI rate

Scenarios

The evaluation used a hospital perspective
Two scenarios of 15 and 30% were used to estimate the association between increased hand hygiene compliance and the reduction in HAIrs

Costs calculated

<table>
<thead>
<tr>
<th>Intervention component</th>
<th>Costs to be calculated</th>
<th>Average cost per method</th>
<th>Total cost (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team education</td>
<td>€622</td>
<td>(95% CI €146 – €1098)</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Effect</th>
<th>Cost difference (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15%</td>
<td>424</td>
</tr>
<tr>
<td>30%</td>
<td>413</td>
</tr>
</tbody>
</table>

Cost and effects

Incremental cost-effectiveness ratio of €622 (95% CI €146 – €1098) per extra percentage of hand hygiene compliance gained due to the team and leaders-directed strategy

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Health care costs

- The cost of a hospital infection consists mainly of extended hospital stay, increased medical and nursing care, operations and consumables, microbiology tests and investigations, and antibiotics and other drugs.
- The cost estimate was set on 5455 euro per infection, based on previous estimates and indexed to the price level of 2009, using the Dutch consumer price index figures for health care costs.

Results modeling

30% scenario
- Incremental cost-effectiveness ratio of € 2074 (95% CI, € 487 - € 3661) This means that a ward has to invest € 2074 for an additional percentage reduction in the HAI rate.

15% scenario
- Incremental cost-effectiveness ratio is € 4125 (95% CI, € 1016 - € 7234) This means that a ward has to invest € 4125 for an additional percentage reduction in the HAI rate.

Willingness to Pay

Conclusions

- The team and leaders-directed strategy resulted in 9% more hand hygiene compliance at a cost of € 5497 per ward.
- Savings in favour of the team and leaders-directed strategy:
  - 30% scenario: € 13,879 (reduction HAI 2.7%)
  - 15% scenario: € 6,939 (reduction HAI 1.35%)

- Is it a good deal?

Explaining the effects

Integrating process and outcome evaluations

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Research questions
1. What impact might variation in adherence to the improvement strategies as planned have on changes in nurses’ HH compliance?
2. What impact might specific contextual factors as hospital and ward characteristics have on changes in nurses’ HH compliance?
3. What impact might differences in nurses’ actual experiences with strategy components have on changes in nurses’ HH compliance?

Adherence to the strategies
• Both improvement strategies were carried out with good adherence to protocol
• The evaluation of strategy adherence did not provide any explanatory variables associated with changes in nurses’ HH compliance

Contextual factors
• For both study groups, baseline HH scores were negatively correlated with follow-up scores ($r = -0.693; p = 0.000$)
• We found a hospital effect on changes in HH compliance in long term ($p = 0.036$)

Nurses’ experiences 1
Positively correlated with increased HH compliance
• Feedback about team members HH performance
• Social influence
  • Colleagues support each other in performing HH
  • Team members address each other in case of undesirable HH behaviour

Nurses’ experiences 2
Positively correlated with increased HH compliance
• Leadership
  • Ward manager designates HH as a priority
  • Ward manager addresses barriers to enable HH as recommended
  • Ward manager holds team members accountable for HH performance
  • Ward manager actively supports team members

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Multidisciplinary settings

Problem

MRMS

A pilot study

Results

Conclusions

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Future directions
Patient involvement? Reward and punishment?

Thank you for attending this lecture


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