IMPLEMENTING AN ELECTRONIC HAND HYGIENE TRACKING DEVICE AT AN ACUTE-CARE FACILITY

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Abstract

Background With hand hygiene (HH) compliance seldom reaching 55% in healthcare, electronic monitoring systems (EMS) are supporting the gold standard of measuring with direct observation and feedback to increase compliance. We sought to determine the impact of HH compliance on an EMS in an acute-care facility and to analyze theoretical constructs of healthcare workers (HCWs) and factors that impact program success and improvement.

Methods Peredoma-like EMS devices were carried by 11 HCWs in a wing of a 117-bed acute-care hospital during a 4-week period. Compliance was measured by direct observation and electronic monitoring through an ECMS and a recording of patient hand and touch-free dispensers. Feedback was delivered during Phase I, enabled during Phase II, and compared between work shifts and study phases.

Results During Phase I, HH compliance measured by direct observation was 53.3% compared to 37.1% measured by ECMS. During Phase II, direct observation compliance decreased by 46.4% while ECMS increased to 50.8%. There was a statistically significant 12% compliance increase from Phase I to Phase II. The GEE model with shift as a fixed effect and work shift as a random effect indicated a significant impact on compliance in Phase II where it was 40.4% during the day and 23.5% at night. However, compliance significantly decreased in Phase III. Post-intervention results indicated shifts were longer than their pre-intervention counterparts and, while statistical significance was not reached, there were improvements in accuracy and differences to device use.

Discussion Single use EMS was able to increase HH compliance and retention of HCWs in the study was challenging, thus improving sample size and leading to potential volunteer bias. Future studies may benefit from applying incentives, penalties, or mandatory use of ECMS to sustain HH compliance. Developing a strong theoretical framework and identifying HH barriers and perceptions among HCWs prior to employing intervention may improve program success.

What We Learned:

The ECMS with self-monitoring real-time, confidential compliance rate feedback was a promising tool to increase HH compliance rates. There were significant differences in compliance rate based on shift, with night shift at baseline being least compliant. Relying on HCWs “good will” to carry the ECMS device during the work shift was not sufficient; would need to be mandatory policy. Future systems would benefit from first identifying barriers to HH compliance through behavioral framework, and then implementing a system that minimizes interruption to a HCW’s daily routine.

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METHODS

Study design, setting, and participants

The study was designed as a prospective, multi-phased, controlled intervention utilizing an ECMS and questionnaire assessments before and at the conclusion of the study. It was performed in a 27-room medical/surgical wing of a 117-bed acute-care facility located in Ravenna, OH and was divided into two phases. A total of 11 HCWs completed the study.

Results

Average hand hygiene compliance rate measured by ECMS before and after feedback intervention among healthcare workers according to work shift.

Hand hygiene compliance rate

Study Phase

Work Shift

Pre-Intervention

Post-Intervention

Mean% Difference

Day

40.4% ± 9.7%**

49.5% ± 16.6%

19.1%

(0.21 to 0.27)

Evening

32.5% ± 8.6%

48.8% ± 16.8%

16.3%

(0.21 to 0.23)

Night

25.3% ± 11.3%

34.6% ± 18.9%

19.3%

(0.21 to 0.24)

Room Trigger

Counting Device

Dispenser Trigger

Example of individual results from the ECMS data uploaded to the system website available to study participants.

Room Trigger

Dispenser Trigger

Example of individual results from the ECMS data uploaded to the system website available to study participants.

Questionnaire Results:

• Only 6 of 11 HCWs completed questionnaires so there was not sufficient sample size to make conclusions from the data.

• There was a trend where the mean score for the HCW’s observer reminders to perform hand hygiene showed a decrease from pre-study to post-study, although the HCWs still saw this favorable on the Likert scale.

Accuracy Assessment:

• Weekly hand hygiene data to ensure functionality of the system showed that the ECMS accurately captured 93.4% of all hand hygiene opportunities and dispensing events.

Conclusions

• The ECMS with self-monitoring real-time, confidential compliance rate feedback was a promising tool to increase HH compliance rates.

• There were significant differences in compliance rate based on shift, with night shift at baseline being least compliant.

• Relying on HCWs “good will” will’ carry the ECMS device during the work shift is not sufficient, would need to be mandatory policy.

• Future systems would benefit from first identifying barriers to HH compliance through behavioral framework, and then implementing a system that minimizes interruption to a HCW’s daily routine.

What We Learned:

• Some nurses felt it was too much effort to pick up the reader and wear it, and participants did not feel engaged.

• Staff were not always sure when they should perform HH.

• Participants could not understand rooms without devices did not detract from their compliance scores.

• Some participants were doubtful of accuracy even though data confirms system was highly accurate (93.4%).

• Participants conveyed carrying the tracker definitely increased awareness to perform HH.

• Participants that completed the study were likely some of the more motivated staff.

• Participants may have used website more if it was available on each workstation on wheels.

• Inadequacy of direct observations confirmed due to the significant discrepancy in data when compared to electronic monitoring.

• Electronic record implementation occurred during study which likely contributed to attrition, and may explain decrease in overall hand hygiene score for entire unit based on visual observation.

What We Learned:

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