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Integration of Evidence-Based Nursing Content: A Collaborative Study

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Abstract

In 2005, Pinnacle Health System, Zynx Health, and Siemens Medical Solutions developed a partnership to conduct a study, exploring opportunities and challenges associated with integration of evidence-based knowledge within the Electronic Health Record (EHR) with the goal of creating repeatable methodologies for nursing knowledge integration. The two-phase study involved access to referential evidence-based content and integration of customized evidence-based plans of care within EHR documentation applications.

Key results, to date, of this ongoing study include identification of data model variations between evidence-based knowledge sources and hospital information systems that expose pre/post coordination challenges; greater insight into how structured data elements should appear to end users in terms of form, order, and context; staff nurse response to availability of evidence-based content in care planning and documentation workflow; and impact of customized evidence-based plans of care on organizational processes of incorporating evidence-based practices into clinical practice. Findings included general satisfaction of the content, validation of the importance of strong nursing leadership related to implementing evidence-based practices in the organization, the need for client vendor partnering, and data documenting positive impact of integrated evidence-based content on quality of care.

Keywords:

patient care planning, outcome assessment, evidence-based medicine

Introduction

Study objectives and questions

The overall goal of this evaluation study was to test the impact of an electronic health record populated with nursing knowledge and evidence for use by nurses in assessing, planning, evaluating, and communicating patient care. During the study, both referential and integrated knowledge and evidence populated clinical applications. Referential knowledge and evidence is defined as synopses of evidence and evidence sources classified according to type of study.

The referential knowledge and evidence was available through links from specific points in the clinical workflow within Siemens applications. Integrated knowledge and evidence is defined as evidence-based assessment tools, order sets, and nursing orders/plans of care that were integrated for use in the Siemens clinical applications.

The specific objectives of the study were to:

1. Gain an understanding of the technical factors related to providing access to Zynx Health knowledge and evidence from within Siemens applications;
2. Gather data regarding various nurse users' reactions to the availability of Zynx Health knowledge and evidence in these applications;
3. Identify the specific locations within the clinical system interface from which Zynx Health knowledge and evidence knowledge provides value for nurses; and
4. Identify requirements related to the integration of nursing knowledge within the electronic health record, specifically focused on knowledge structure, content, and components most valuable to nursing practice.

Methods

The study included two phases.

Phase I: Referential performance measures and quality indicators

The first phase of the study focused on providing links from Siemens clinical systems to Zynx Health referential knowledge and evidence. Links to evidence about four nursing sensitive performance measures, patient falls, acute pain, pressure ulcers, and smoking cessation, were provided to bedside clinicians. Users had the ability to link, via a display icon, from Siemens care planning and documentation screens to the Zynx Health evidence regarding the four patient problems and return to the care planning or documentation application.

Phase II: Customized evidence-based plan of care content integrated in care planning and documentation applications

The focus of Phase II was the customization of Zynx Health evidence-based plans of care for the Pinnacle organization and integration of the content of the plans in Siemens care planning and documentation applications. The project team chose six Zynx Care plans of care that addressed key patient problems at Pinnacle: pain management, prevention of surgical site infection, prevention of ventilator-acquired pneumonia, tissue perfusion, and fall prevention. Three teams of Pinnacle nurses including clinical nurse specialists, clinical educators, staff nurses, and an Information Systems nurse liaison were formed and each team customized two plans of care. The evidence-based plans provided by Zynx include comprehensive expected outcomes and interventions assembled using a strict evidence-based methodology. The plans also include evidence links to synopses of the evidence and classified references. The plans are available in a content management tool that supports creation of plan versions specific to a particular organization.

Results

The study showed that referential access to clinical knowledge provides the most value when there are numerous devices; access from any location within the clinical area; Google-type searches for clinical topics; contextual sharing of patient specific information; and access to "nurse dashboards" that provide access to evidence about common patient problems. Integrating the plans of care within the hospital information system revealed variations in data models between evidence-based knowledge sources and hospital information systems that exposed pre/post coordination challenges, requiring modifications in the codes used within the dictionaries in the hospital information system.

Phase I results

Results of Phase I included staff reports of the value of available evidence-based content in providing them with information they had forgotten or was new; variation in the frequency of using the links to access evidence; and, preference for evidence available during care provision, rather than during documentation. Phase I results also included observation of the critical importance of initial and ongoing involvement of the Chief Nursing Office as champion of the study as well as the Nurse Educators. Initial education regarding evidence-based practice and the study was provided by the Nurse Educators.

Phase II results

The teams of Clinical Nurse Specialist, Nurse Educators, bedside nurses, and informatics nurses who developed organizational evidence-based plans of care using the vendor model plans of care, content maintenance tools, and customization tool reported several key observations.

- First, they observed that the time to complete an organizational plan decreased to less than 12 hours compared to the previous approach that took several months.
- Secondly, they reported that the quality of the plans was significantly better because the plans were based on evidence developed with a strict methodology.
- Lastly, they reported the customization process itself was very positive because it engaged the members in interesting, clinically relevant discussions and fostered collaboration between Nursing and the Information Systems Departments.

Data on the impact of integrated evidence-based assessments and plan of care content included bedside nurse reported perceptions and quantitative data related to fall rates and frequency of pain reassessment. Bedside nurses reported that the integrated assessment and plan of care content expanded their knowledge; provided accessible information so that they did not have to go to books for needed information; and that the embedded content was accessible, detailed and specific, and provided the basis for more meaningful assessments.

Overall perception of the value of the evidence-based content implemented into plans of care for Pain – Acute, Mobility – Impaired, Infection – Risk of, Surgical Site Infection, and Falls – Risk of was favorable. Plans of care for Infection – Risk of, Ventilator-Associated Pneumonia and Tissue Perfusion – Cardiopulmonary, Altered were perceived to be less helpful to the end users' planning of patient care. Figure 1 depicts the statistical mean, based on a 6-point Likert Scale, regarding the end users' perceptions of the value of each specific plan of care content.

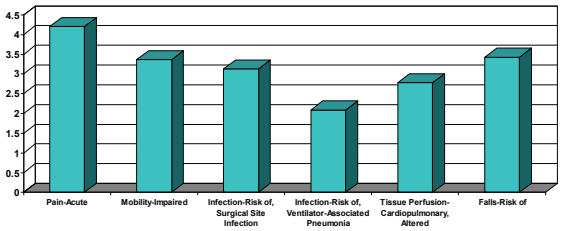

Figure 1- Value of specific content

In addition, it was observed that, following the implementation of integrated evidence-based pain assessments, fall risk assessments, and pain and fall risk plans of care, the documentation of pain reassessment improved from 76% to 94% compliance. Subsequently, there was a reduction in

the number of falls with sustained injuries noted in the organization.

Discussion and conclusion

This study demonstrated that positive value could be achieved through the integration of evidence-based knowledge within automated assessment and plan of care documentation, for use at the point of decision-making. The study fostered collaboration between clinical staff nurses and the information systems department and through this collaboration staff nurses were able to define with greater precision how structured data elements should appear to end-users in terms of form, order and context.

The study serves as a case example of a repeatable implementation model, starting with access to referential content while moving concurrently towards tighter levels of content integration within assessment and plan of care documentation functions. Success was contingent on five fundamental requirements: a strong partnership of the three organizations; strong nursing leadership, evidence-based content; tools to customize the content in accordance with institutional practices; a flexible hospital information system; and an inter-disciplinary team of experts from Pinnacle Health, Zynx Health and Siemens Medical Solutions. The implementation model can be replicated in other facilities.