NENIC Year in Review
Spring 2016 – Winter 2017

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Conflict of Interest

Kathleen Donaher-Keough and Andrew Phillips have no real or apparent conflicts of interest to report.
Learning Objectives

• Evaluate themes that impact nursing informatics.
• Identify gaps in nursing informatics research.
• Generate logical next steps in advancing nursing informatics research.
Methods – Scoping Study

• Arksey and O’Malley¹
  • Step 1 – Identify the Research Question
  • Step 2 – Identify Relevant Studies
  • Step 3 – Study Selection (Iterative process which can change over time)
  • Step 4 – Charting the Data
  • Step 5 – Collating, summarizing, and reporting the results
  • Step 6 – Consultation – This is you guys

Step 1: Research Question

• What trends and themes emerge from a survey of the published literature in the area of nursing informatics during the past year

• Make meaning of current and past themes – historical context.
Step 2: Identify Relevant Studies

• Search Strategy
  • Databases: PubMed and CINAHL
  • Search terms
    • ("nurse" or "nursing") AND "informatics") OR "nursing informatics"
    • Publication Dates 3/1/2016 – 2/28/2017
  • New issue – "roaming publication dates" due to publication process (accepted publications based on date noted in search)
Step 3: Study Selection

Inclusion and Exclusion Criteria

• Inclusion criteria: Research, contributes to nursing informatics knowledge base, prototype development and testing, clinical care delivery focus; informatics

• Exclusions: Articles that focused on informatics education programs, nursing education, nursing students, competencies, simulation

Re-evaluate for future?
Search Results (flow chart)

PubMed (497)  CINAL (102)

Total (599)  Duplicates (36)

Available for Review (563)  Abstract Review (426)

Full Text Review (137)  1 non-english 7 not retrievable

Articles Evaluated (129)
New methodology adopted.

Articles Included in Evaluation

- 2012-2013: 35
- 2013-2014: 48
- 2014-2015: 33
- 2015-2016: 81
- 2016-2017: 129
NENIC Publications

• Show of hands??
Research by Setting (%)
2016-2017

- Ambulatory: 25%
- Community/Public Health: 16%
- Continuum of Care: 10%
- Health Professional/Expert Panel: 11%
- Hospital: 15%
- LongTerm Care: 15%
- Other (Theory/Design/Standards): 8%
Research Setting (%) By Year

- **Categories becoming harder to distinguish**
- **Breadth of setting and potential link to consumer focus from setting focus**
- **Trend toward non-HITECH settings**
- **Systems have become settings**

- **2012-2013**
- **2013-2014**
- **2014 - 2015**
- **2015 - 2016**
- **2016 - 2017**
By Country (%) 2016-2017

Note: While first author country is noted here, many of the US authored studies were performed in other countries.
Step 5 – Collating, summarizing, and reporting the results
Themes Identified

1. Potential for direct consumer involvement and engagement
2. Process/Workflow/Outcomes/QI (Deep Structure)
   Patient/consumer involvement/empowerment
3. Public Health and Reporting (learning health system)
4. Transitions of Care
5. Big Data continues (patient as population)
   Data Mining
   Public and Population Health Precision nursing
6. Cost effectiveness, identification of value, QI (Patient as customer)
7. Cultural Sensitivity (patient)
8. Technology Acceptance, usability (patient/consumer), competencies
9. Care Coordination, Interprofessional Care, Collaboration, Shared Decision Making (patient/consumer now included)
10. Movement to new settings of care – LTC, Skilled Nursing, Home Health, School Health, Smart Home (patient)
11. Reevaluation of Existing IT
Highlighted Publications

Spring 2016 – Winter 2017
Changing the “deep structure” of the delivery system to capture the patient/persons story, support engagement, and coordinate care.
Policy framework was evident in the literature...
...evidence of need for deep structural change and consumer involvement.


**Topic**: Structural change to capture the story, support engagement, and coordinate care.

**Purpose**: Demonstrate knowledge discovery with broad applicability - for patients, clinicians and institutions – need for common framework for use and re-use of existing EHR data.

**Methods**: Applies “big data analytics” to a data repository of hospital generated nursing care plans (>300,000 care plans from HANDS dataset for ~35,000 patients) using Knowledge Discovery Framework

**Findings**: Confirms benefits of standards in knowledge discovery from multiple perspectives. Consumer choice; nursing can “see” link between intervention and improved outcomes over time.

**Implications**: Capturing a multidimensional story to affect outcomes.

**Topic:** Structural change to capture the story, support engagement, and coordinate care.

**Purpose:** Can we use existing data standards supported by ONC and others to effectively communicate nursing care plans across systems and settings as part of the “patient story.”

**Methods:** Examination of existing methodologies with a “use case”

**Findings:** Demonstrates the successful mapping of the nursing process to SNOMED and LOINC using HL 7 C-CDA - interoperability

**Implications:** Capturing patient story is not easy, but it is possible using existing standard ontologies

**Topic**: Structural change to capture the story, support engagement, and coordinate care.

**Purpose**: Investigation into efficacy of alerts and reminders to consumer to support Patient Self-Management

**Methods**: Review of the literature

**Findings**: Automated reminders were shown to “work” including appointment, adherence and behavioral reminders. Evidence supported by 23 out of 51 studies were RCTs

**Implications**: Economic evaluation limited across studies; environment influences success, but success goes across gender, age, and socioeconomic status. *Economic Value must be demonstrated to inform public policy.*

**Topic:** Structural change to capture the story, support engagement, and coordinate care.

**Purpose:** To evaluate the extent HIT is “involved when transitioning patients between emergency departments, acute care hospitals, skilled nursing facilities, and home health agencies in settings”

**Methods:** Expert Panel and Literature Review

**Findings:** Identified gaps from a lack of interoperability and link to community resources

**Implications:** Unrealized Potential of HIT in coordination of care, but also found that not all processes should be automated
Technology acceptance and inclusion of patient and family

**Topic** – Technology acceptance by nursing. Adaption of existing acceptance models to nursing.

**Purpose** – Tests an adapted TAM which includes learnability, usefulness for patient/family engagement, and social influence from institution, patients and families and others.

**Methods** – Cross sectional survey within a Pediatric ICU (new EPIC System based Interactive Monitor) and stepwise linear regression for model fit.

**Findings** – Perceived usefulness for patient caring strongest predictor of intention to use and satisfaction. Perceived usefulness for patient/family involvement also found to be significant and social influence, while week, also significant.

**Implications** – Technology acceptance models with greater healthcare focus needed (patient caring) and role of patient and family in satisfaction and intention to use.

![Diagram](image-url)  

*Fig. 2* Stepwise regression results for the adapted model of technology acceptance. (Only retained model variables are shown)
Process Improvement and Quality Improvement

**Topic – Process Improvement, Quality Improvement, Care Coordination**

**Purpose** – Can the secondary use of EHR data be used to enhance accuracy or process understanding using Failure Mode Effects Analysis (FMEA) method and guide quality improvement.

**Methods** – Using FMEA practices/protocols, hand-drawn process maps were developed by interdisciplinary team of expert clinicians. Map included activities who completed them.

**Findings** – 35% of activities were completed by unexpected providers including providers not part of the documented workflow

**Implications** – Access to greater data provided by EHR and other electronic sources has the ability to greatly improve process documentation accuracy – first step for improving quality. Also highlighted the true interdisciplinary nature of patient care.
Figure 2: Redrawn process map of discharge-related activities on an inpatient cardiology unit with diagnostic characteristics indicated, as determined by data extracted from the institution’s Enterprise Data Warehouse. New activities not identified in the process map are noted in yellow. Highlighted diagnostic measures indicate where observation differs from expectation.
<table>
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<th>Activity Type</th>
<th>EHR Action Type</th>
<th>Freq.</th>
<th>Count of Providers</th>
<th>Experience</th>
<th>Diversity</th>
<th>Discordance (%)</th>
<th>Inaccuracy</th>
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Wild Card – Reevaluation of “Old” Technology – The pager

**Topic: Wild Care**

**Purpose:** What is the quality of paging data and does it contribute to communication failures.

**Methods:** Retrospective analysis of paging data at large US health system

**Findings:** Large number of non-critical messaging “clamor” (estimated 2 – 8 pages per hour/physician)

**Implications:** Tough to move away from old technologies which require reevaluation as part of process. Creates a significant amount of duplicative information.
Step 6 – Consultation

Feedback and Professional Input...