The Relationship between Nursing Documentation in EHR and the Incidence of Pressure Ulcers in the Intensive Care Units

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Brief Overview

- An Electronic Health Record (EHR) is a longitudinal electronic record of patient health information generated by clinical encounters in a care delivery setting.

- The EHR is an important and emerging type of health information technology.

- EHR data must be leveraged for performance measurement in order to make strides in quality improvement.
Brief Overview

• Pressure ulcers are observed in patients across the care continuum including the intensive care units (ICUs).

• The incidence in ICUs between 1–56%¹,² and in Non-ICU units between 1–11%³,⁵.

• Costly to the health care system

• Require consistent objective assessments and documentation in order for proper treatment to occur⁴.

Statement of the Problem

• Lack of accuracy and completeness in pressure ulcer documentation⁵–⁷

• Inadequate documentation of pressure ulcer condition, treatment, and preventive measures⁷,⁹

• Valid and reliable data needed on pressure ulcer recording⁴,¹⁰
Current State of Knowledge and Gaps

• Preliminary evidence: the impact of an EHR on the provision of safe and quality care to the hospitalized patients

• Only few studies specifically focused on impact of the EHR on healthcare-related outcomes, especially pressure ulcer incidence

Purpose of the Study

1) To explore the quality and comprehensiveness of nursing documentation of pressure ulcers.

2) To investigate the relationship between the nursing documentation of pressure ulcers and the incidence of pressure ulcers in Intensive Care Units (ICUs).
Theoretical Framework

Donabedian’s (1966) Structure-Process-Outcome (SPO) model

- The element of structure is defined as the physical and organizational properties of the setting in which health care takes place and relates to the organization of health care resources.

- The element of process describes care activities, which are categorized into technical style and interpersonal style.

- The element of outcome is defined as “a change in patient’s current and future health (symptoms and functioning) that can be attributed to antecedent health care” (Donabedian, 1980, p.82). Outcome also refers to the end result of the process of care.

Concepts in the Present Study

- Structure
  - Nurse Characteristics
    - Shift
    - ICU Setting

- Structure
  - Patient Characteristics
    - Gender
    - Age
    - Length of Stay
    - Nutritional Status
    - Primary Diagnosis

- Process
  - Documentation
    - Quality
    - Comprehensiveness

- Outcome
  - Pressure ulcer Incidence

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Review of Literature

Nurse Characteristics:
- **Shift**
  Night shift workers may have significant negative effects on job performance and social functioning.
- **ICU setting**
  Surgical patients are having an extended period of pressure during the surgical procedure.

Patient Characteristics:
- **Gender**
  No consistent evidence indicates that one gender is more susceptible to pressure ulcers than the other.
- **Age**
  Most studies show that age is associated with pressure ulcer incidence.

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Review of Literature

Patient Characteristics:
- **Nutritional status**
  - CMS and AHRQ
  - Pressure ulcer patients had a lower albumin and pre-albumin level
- **Length of stay**
  - The association of LOS and pressure ulcers is supported in many studies.
- **Primary diagnosis**
  - Cardiovascular disease, respiratory disease and diabetes
  - Orthopedic and spinal cord injuries
Research Questions

1. What is the relationship between quality and comprehensiveness of the nursing documentation on the incidence of pressure ulcers in ICUs located in a South Florida Hospital?

2. Do the patients with pressure ulcers differ in the patient characteristics (age, gender, length of stay, nutritional status and primary diagnosis) from the patients without pressure ulcers?

3. Are there associations between staff nurses characteristics (shift and ICU setting) and the quality/comprehensiveness of pressure ulcer nursing documentation?

Method

Study design

- Retrospective
- Comparative
- Descriptive
- Correlational

Data Collection Procedures

- Participants in this study were not be required to submit informed consent.
- Chart reviews of patients’ demographic and clinical information complied with HIPPA confidentiality agreements.
Method

Sample and Setting

- Inclusion criteria
  - a) admitted to one of the Intensive Care Units (MICU, SICU, CVICU, and Neuro ICU) during the time period of September 01, 2011 through September 30, 2012;
  - b) length of stay in any of the ICU’s was equal to or greater than 3 days;
  - c) documentation of a pressure ulcer(s) during their LOS in the ICUs;
  - d) older than 18 years old.

- Exclusion Criteria
  - a) not directly admitted to an ICU but were transferred from other units within the hospital;
  - b) if a pressure ulcer(s) were documented on admission;
  - c) if patient was discharged or transferred within 48 hours of getting pressure ulcers.

98 pressure ulcer patients and 98 patients without pressure ulcers.

The total collected EHR documentation was 392. The total collected written medical documentation was 196.

Variables and their Measurement

- Independent variables
  - Nurse characteristics
    - Shift
    - ICU setting
  - Patient characteristics
    - Age
    - Gender
    - Length of stay
    - Nutritional status
    - Primary diagnosis

- Dependent variables
  - Quality of pressure ulcer documentation
    - Every aspect of a pressure ulcer
  - Comprehensive documentation of pressure ulcers assessment, diagnosis, planning, implementation and evaluation
  - Incidence rate of pressure ulcers
## Results

### Demographic Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Pressure ulcer group ( M (SD) )</th>
<th>Non-pressure ulcer group ( M (SD) )</th>
<th>TOTAL ( M (SD) )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range</td>
<td>Range</td>
<td>Range</td>
</tr>
<tr>
<td><strong>AGE</strong></td>
<td>71.59 (13.04) 32-97</td>
<td>69.84 (16.14) 27-103</td>
<td>70.71 (14.66) 27-103</td>
</tr>
<tr>
<td><strong>LOS</strong></td>
<td>9.97 (7.16) 3-51</td>
<td>5.54 (3.92) 3-21</td>
<td>7.76 (6.17) 3-51</td>
</tr>
</tbody>
</table>

### Nutritional status

<table>
<thead>
<tr>
<th>Nutritional status</th>
<th>Pressure ulcer group N (%)</th>
<th>Non-pressure ulcer group N (%)</th>
<th>TOTAL N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin (g/dL)</td>
<td>41 (41.8) 35 (35.7) 13 (13.3) 8 (8.2) 12 (12.2) 38 (38.8) 35 (35.7) 13 (13.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-albumin (mg/dL)</td>
<td>14 (14.3) 31 (31.6) 39 (39.8) 13 (13.3) 5 (5.1) 15 (15.3) 44 (44.9) 31 (31.6)</td>
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</tr>
</tbody>
</table>

### Primary Diagnosis

<table>
<thead>
<tr>
<th>Primary Diagnosis</th>
<th>Pressure ulcers N (%)</th>
<th>Non-pressure ulcers N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular</td>
<td>29 (29.6)</td>
<td>30 (30.6)</td>
</tr>
<tr>
<td>Infection</td>
<td>20 (20.4)</td>
<td>12 (12.2)</td>
</tr>
<tr>
<td>Respiratory</td>
<td>16 (16.3)</td>
<td>18 (18.4)</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>12 (12.2)</td>
<td>8 (8.2)</td>
</tr>
<tr>
<td>Renal</td>
<td>6 (6.1)</td>
<td>9 (9.2)</td>
</tr>
<tr>
<td>Orthopedic</td>
<td>6 (6.1)</td>
<td>2 (2.0)</td>
</tr>
<tr>
<td>Cancer</td>
<td>4 (4.1)</td>
<td>5 (5.1)</td>
</tr>
<tr>
<td>Metabolic Disorder</td>
<td>3 (3.1)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Neurological</td>
<td>2 (2.0)</td>
<td>2 (2.0)</td>
</tr>
</tbody>
</table>
The results of this study revealed a lower pressure ulcer incidence (2.3%) overall, compared to other studies.

Among the 392 patients' EHR documentations with pressure ulcers, a full pressure ulcer description was only available in two EHR documentations.

Diagram: Comparison of pressure ulcer incidence across different studies.
Discussion

The quality and comprehensiveness scores in the MICU were statistically significantly higher compared to the CVICU and the Neuro ICU. However, there were no statistically significant differences between the MICU and SICU.

The monthly quality or comprehensiveness score was negatively associated with the incidence of pressure ulcers for the overall sample. However, the quality or comprehensiveness of nursing documentation and the incidence of pressure ulcers in ICUs was not statistically significant.
**Discussion**

- Among the 392 EHR documentations with pressure ulcers, documentation in an incorrect section was found in 91 EHRs.

Los of pressure ulcer patients was statistically significantly higher than non-pressure ulcer group.
Discussion

There was a statistically significant difference between albumin levels and pre-albumin levels of pressure ulcer patients when compared to patients without pressure ulcers.

There were no statistically significant differences in quality or comprehensiveness score between dayshift and nightshift.
Implications

- Education
  - Nursing students
  - Staff nurses

- Practice
  - Pressure ulcer prevention
  - Legal
  - Reimbursement
  - Regulatory

Three questions

- Is Electronic Health Record an efficient tool to document pressure ulcers?

- What should include in a pressure ulcer documentation?

- What will happen if pressure ulcers are not documented properly?
References


Thank you!