Improving Pressure Ulcer Outcomes in Acutely Ill Adult Patients with Developmental Disabilities

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Purpose

Purpose:
- Implement a quality improvement project to assist an acute care facility in eliminating hospital-acquired pressure ulcer (HAPU) development and/or progression in patients with a Developmental Disability (DD).
- Improve organizational structure and process, clinical outcomes, quality, and cost within this vulnerable population.

Background

- DD’s are chronic conditions related to mental and/or physical deficits that can occur anytime during development up to age 22. 2
- 5 million Americans have a DD. 3
- In 2008, the prevalence of DD’s increased by 17.1%, 2
- Complicated conditions put DD patients at a higher risk for developing a pressure ulcer. 4
- The cost of a single pressure ulcer ranges from $20,000 to $151,700. 1
- This patient population requires specific equipment and specialized care to prevent pressure ulcers. 5
- The literature suggests there is a lack of education and standardized protocols. 6

Solution

- Development of a comprehensive education program, infrastructure support, and workflow changes for healthcare providers.
- Phase I: quantifying pressure ulcer (PU) problem, identifying educational needs, and development of an education workshop on patients with DD’s in April, 2015.
- Trained staff included: registered nurses, physical, occupational, and speech therapists, lift team, certified wound ostomy nurses, respiratory therapy, dietitian, and case management.

Intervention

- Designated admitting units include: medical ICU, medical surgical ICU, a step down unit, and the neuroscience unit.
- The staff on these units participated in a three-hour education workshop on patients with DD’s in April, 2015.
- Trained staff included: registered nurses, physical, occupational, and speech therapists, lift team, certified wound ostomy nurses, respiratory therapy, dietitian, and case management.

Framework

- Donabedian’s Quality Framework was used to guide this project (Fig. 1). 1, 3
- Encompasses clinical expertise, services, resources, and programs in the delivery of health care. 3
- Implementation of intervention is based on structure, process, and outcome. 7
- Structure: acute care facility, resources and qualified staff.
- Process: delivery of education program and execution of protocol and tools for support.
- Outcome: change in clinical practice and professional behavior to improve HAPU’s and organizational performance indicators.

Methods

Setting:
- Non-profit, magnet designated, level I trauma center, 1,011 beds.
- Design:
- Observational retrospective chart review, pre and post intervention.
- Sample:
- 30 patient charts pre-intervention and 22 patient charts post-intervention were reviewed that were diagnosed with a DD prior to age 22 and were > 18 years of age.
- Intervention:
- Implementation of phase I (fig. 2).
- Interval Data Collection:
- Pre-intervention: October 1, 2015 to April 26, 2016.
- Post-intervention: April 27, 2016 to October 25, 2016.
- Analysis:
- Student’s independent t-test and Mann Whitney U test were used to compare means and Pearson’s chi-square for categorical values. P value set at 0.1 for statistical significance.
- A test of proportions using the z-test was calculated to compare pressure ulcer progression and improvement between the pre-education group and the post-education group.

Results

- Table 1: Demographic and Clinical Information of the Pre and Post Intervention Samples

<table>
<thead>
<tr>
<th>Description</th>
<th>Pre-Education (N=20)</th>
<th>Post-Education (N=22)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Mean: 40.47 years</td>
<td>Mean: 38.33 years</td>
<td>0.623</td>
</tr>
<tr>
<td>Gender</td>
<td>Male: 33.3%</td>
<td>Female: 66.7%</td>
<td>0.014</td>
</tr>
<tr>
<td>Race</td>
<td>Caucasian: 73.3%</td>
<td>Caucasian: 63.6%</td>
<td>0.715</td>
</tr>
<tr>
<td>DD</td>
<td>10.0%</td>
<td>10.0%</td>
<td></td>
</tr>
<tr>
<td>Cerebral Palsy</td>
<td>16.7%</td>
<td>16.7%</td>
<td>1.000</td>
</tr>
<tr>
<td>Spina Bifida</td>
<td>30.8%</td>
<td>30.8%</td>
<td>1.000</td>
</tr>
<tr>
<td>Developmental Delay</td>
<td>18.7%</td>
<td>18.7%</td>
<td>1.000</td>
</tr>
<tr>
<td>Autism</td>
<td>6.7%</td>
<td>6.7%</td>
<td>1.000</td>
</tr>
<tr>
<td>Down Syndrome</td>
<td>6.7%</td>
<td>6.7%</td>
<td>1.000</td>
</tr>
</tbody>
</table>

- Table 2: Patients Pressure Ulcer Outcomes

<table>
<thead>
<tr>
<th>Description</th>
<th>Pre-Education</th>
<th>Post-Education</th>
<th>Z-test</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Progressed</td>
<td>28%</td>
<td>63.6%</td>
<td>2.011</td>
<td>&lt;0.044</td>
</tr>
<tr>
<td>Improved</td>
<td>0%</td>
<td>83.3%</td>
<td>5.481</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Discussion

- Descriptive statistics were not significantly different in age, race, DD diagnosis, admission diagnosis, or PU on admission.
- Post-education sample had more PU’s, contractures and were less mobile on admission.
- Post-education group appeared to have more extensive diseases, yet outcomes were significantly improved.
- The incidence of PU improvement was significantly greater in DD patients post-education (p = 0.001).
- The incidence of pressure ulcer progression was significantly greater in DD patients pre-education (p = 0.044).
- This intervention appears to be statistically and clinically significant in the reduction and/or progression of HAPU’s.
- This project suggests that ongoing patient morbidity and costs associated with HAPU’s may decrease with this initiative.

Future Steps

- Implementation of phase II and III.
- Go live for the FY1 flag, passport, system list, interdisciplinary team huddle and DD nursing care / specialty consult order set.
- Implement nutrition and contracture protocols.
- Further evaluation of initial patient outcomes at 3 and 6 months post full implementation.
- Implement a nurse specialist liaison for monitoring of outcomes and continual process improvement initiatives: pressure ulcers, contractures, weight loss, restraint use and length of stay.
- With addition of phase II and III, this study suggests outcomes may further improve and ensure appropriate care.

References


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- Lastly, I want to thank Jason Beckstead, PhD for assisting me in my statistical analysis development.

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- Table 2: Patients Pressure Ulcer Outcomes

- Figure 1: Donabedian’s Quality Framework
- Figure 2: Phase I
- Figure 3: FY1 Flag on Chart
- Figure 4: Test of Proportions

Figure 3: FY1 Flag on Chart

Table 2: Patients Pressure Ulcer Outcomes

- Progressed
- Improved

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Figure 2: Phase I

Figure 3: FY1 Flag on Chart

Figure 4: Test of Proportions

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