Evidence for the Relationship between Work Organization, Worker Safety, and Patient/Resident Outcomes

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“[Healthcare and Social Assistance] is burdened by the historical and entrenched belief that patient care issues supersede the personal safety and health of workers and that it is acceptable for HCSA workers to have less than optimal protections against the risks of hazardous exposures or injuries.”
Health Care Worker (HCW) Safety and Patient Safety

- Patients (& residents) and employees occupy a common environment, with common hazards.
- Patients affect employees’ health
- Employees affect patients’ health

*Patients and HCWs are both part of the same health care system. The environment of care and the environment of work are the same.*

- Dr. Andrew Vaughn, Mayo Clinic
Promoting Caregivers' Physical & Mental Health via Transdisciplinary Intervention (“ProCare”)

- Evaluate a safe resident handling program (SRHP) (2004-06) & other employee health activities in a large chain of long-term care facilities.
Questions for this presentation

1. Is SRH program effectiveness affected by work organization characteristics?

2. Are residents’ satisfaction or clinical outcomes affected by center organizational characteristics?
## Direct Observations of CNA’s

### Exposure Categories:
- Trunk, arm, and leg postures
- Weight in hands
- Lifting equipment (yes/no)

<table>
<thead>
<tr>
<th></th>
<th>F0: Baseline (Pre-SRHP)</th>
<th>F1: 3 mos. post-SRHP</th>
<th>F2: 12 mos. post-SRHP</th>
<th>F3: 24 mos. post-SRHP</th>
<th>F4: 36 mos. post-SRHP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Obs. Periods</td>
<td>60</td>
<td>56</td>
<td>100</td>
<td>88</td>
<td>57</td>
</tr>
<tr>
<td>Total Obs. Moments</td>
<td>15,185</td>
<td>16,031</td>
<td>25,472</td>
<td>24,652</td>
<td>17,365</td>
</tr>
</tbody>
</table>
Equipment Use and Weight in Hands, before/after SRHP (% of investigator observations)
Composite Physical Workload Index: Nursing Assistants and Nurses

Highest Workload

Nursing Assistants While Resident Handling

Nursing Assistants

Nurses
Variability among centers: Nursing aide equipment use while resident handling

* $p < 0.001$ (Cochran-Armitage test of trend)
Variability among centers in physical workload index (nursing aides)

- **Center A**:
  - Equation: $y = -0.0263x + 1.2057$
  - $R^2 = 0.8798$

- **Center B**:
  - Equation: $y = -0.0815x + 1.6354$
  - $R^2 = 0.9115$

- **Center C**:
  - Equation: $y = -0.0126x + 1.2122$
  - $R^2 = 0.3435$

- **Center D**:
  - Equation: $y = -0.0476x + 1.4435$
  - $R^2 = 0.8018$

- **Center E**:
  - Equation: $y = -0.0351x + 1.3461$
  - $R^2 = 0.8208$
Variability among centers: Influence of work environment characteristics

• Change in observed device use or physical workload index, plotted against features of the work environment (multiple data sources):
  – Time pressure (post-observation interviews)
  – Adequacy of equipment (employee surveys)
  – Communication among staff (employee surveys)

• Same 5 centers with direct observations and 24 months of follow-up
Observed Device Use in Resident Handling vs. Perceived Time Pressure

- Slope of Equipment Use While Resident Handling
- Percent Change in Never Feeling Time Pressure

Legend:
- Solid line: Slope of Equipment Use While Resident Handling Over Two Years
- Dotted line: Percent Change in Never Feeling Time Pressure
Physical Workload Index vs. Adequacy of Supplies and Equipment

Chart showing the relationship between the slope of the Physical Workload Index and the percent change in the rating of adequacy of supplies over two years for different centers. The centers are labeled as Center B, Center D, Center E, Center A, and Center C. The x-axis represents the centers, while the y-axis shows the slope of the Physical Workload Index. The right y-axis shows the percent change in the rating of adequacy of supplies. The chart includes a legend indicating the line types for different calculations.
Physical Workload Index vs. Perceived Staff-to-Staff Communication

<table>
<thead>
<tr>
<th>Center B</th>
<th>Center D</th>
<th>Center E</th>
<th>Center A</th>
<th>Center C</th>
</tr>
</thead>
</table>

**Slope of Physical Workload Index**

**Percent Change in Staff-to-Staff Communication Rating**

- Slope of Physical Workload Index Over Two Years
- • Percent Change in Rating of Staff-to-Staff Communication Over Two Years

www.uml.edu/centers/CPH-NEW
Workers’ compensation claims for resident handling incidents (129 SNF’s) before/after SRHP implementation

Rate Ratio

RR of 1.0 = no change vs. pre-SRHP rates
Total annualized net savings = $4.584 million
Overall benefit-to-cost ratio at least 1.68

Average net savings = $143 per bed per year
### Net savings per bed after implementation of Safe Resident Handling Program

<table>
<thead>
<tr>
<th>Time post intervention:</th>
<th>&lt; 5 years (n = 38 )</th>
<th>≥ 5 years (n = 72 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoided turnover costs</td>
<td>$37</td>
<td>$67</td>
</tr>
<tr>
<td>Avoided workers’ comp.: Medical</td>
<td>$124</td>
<td>$257</td>
</tr>
<tr>
<td>Avoided workers’ comp.: Indemnity</td>
<td>$81</td>
<td>$148</td>
</tr>
<tr>
<td>Average net savings per bed</td>
<td>$83</td>
<td>$258</td>
</tr>
</tbody>
</table>
Workplace Health Promotion (WHP) and average SRHP net savings

- Minimal evidence of WHP health benefits (similar prevalences of smoking, obesity, etc.)
- Perhaps those centers have other positive organizational features, which led to WHP activities and also more effective SRHP?
  - Better social support; lower intention to leave job
Use of Lifting Devices by Individual Employees

- Survey data from 18 nursing homes
- Four occasions after “baseline” (implementation of the Safe Resident Handling Program):
  - 3 months (F1)
  - 12 months (F2)
  - 24 months (F3)
  - 36 months (F4)
Individual self-reported equipment use

How often do you use a patient lifting device?

If you don’t use a patient lifting device every time, why not?

- Device unavailable when needed: 25%
- Residents dislike them: 17%
- I feel I don’t need them: 13%
- Not enough time: 7%
- Too much extra effort: 4%
- My co-workers don’t use them: 2%
Proportion of aides citing “Residents do not like” by frequency of equipment use (N= Centers; N'= Nurses Aides)
Is there a relationship between the experiences of nursing home workers and those of residents?
Work environment and residents’ satisfaction or adverse outcomes

- Employee satisfaction: third-party surveys of all employees (40% aides, 20% nurses)
- Resident satisfaction: third-party surveys of residents (35%) or their family members (65%)
- Rates of resident falls, pressure ulcers, and unexplained weight loss: data reported to CMS
- All variables summarized by center (n=194) for 2005-09
Overall employee satisfaction and resident satisfaction (2005-09), by center
Conclusions (I)

Safe Resident Handling Program effectiveness:
- Resident handling equipment use increased
- Ergonomic exposures decreased:
  - Time in resident handling
  - Weight in hands
  - Non-neutral body postures
  - Composite biomechanical load index
- Compensation claim rates and costs decreased
- Turnover rates in clinical staff decreased (perhaps not all attributable to NLP)
Conclusions (II)

Work environment features explain some variability in:

• Program effectiveness among centers

• Use of lift devices by individual workers
  – Not enough time; Devices unavailable; Residents do not like equipment

• Residents’ satisfaction

• Residents’ risk of adverse outcomes (falls, pressure ulcers, unexplained weight loss)
Selected Publications


University of Massachusetts
Lowell
Ms. Sandy Sun
Email: CPHNEW@uml.edu
Tel: 978-934-3268

CPH-NEW primary website:
www.uml.edu/centers/CPH-NEW

University of Connecticut
Dr. Jeff Dussetschleger
Email: JDussetschleger@uchc.edu
Tel: 860-679-1393

CPH-NEW website at Univ. Conn.:
www.oehc.uchc.edu/healthywork/index.asp

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