Disparities in perceptions of the work organization and associated injury risk among acute-care hospital workers

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May 8-11, 2018
Background and rationale

- Healthcare workers have high injury rates

- Documented disparities in worker injury by race, occupational grade, and immigrant status

- Should we focus on worker-level or workplace-level risk factors for injury?

Sources: Boden et al., 2012; Lay et al., 2017; Krieger, 2010
Goal of study

• Initially set out to evaluate whether working conditions explained social disparities in injury rates
  – Failed to reject null

• New research questions emerged:
  – Do vulnerable and non-vulnerable workers in the same units have similar perceptions of the work environment?
  – Do associations between work environment and injury risk vary by worker vulnerabilities?
Data: Boston Hospital Workers Health Study

- Longitudinal, integrated database study of 8,500 patient care workers at two large Boston-area hospitals
- Survey data from 2012 on a subset of participants (n=1,543, 80% response rate)

- Demographic characteristics of sample:
  - 19% non-white
  - 15% immigrant
  - 9% low-wage
  - 93% women

Source: Sabbath et al., under review
Measures

• Injury: Self-reported injury in 12 months prior to survey
  – Why not use administratively-reported injury?

• Race, job title, and immigrant status assessed on survey

• Work environment measures:
  – Ergonomic practices: extent to which work is designed to reduce biomechanical load; 6 questions
  – People-oriented culture: trust and cooperation in the work environment; 4 questions
  – Unit safe patient handling practices: perceptions of norms around safe patient handling; 3 questions

Sources: Amick et al., 2000; Caspi et al., 2013
Injury rates vary by worker vulnerability

*Odds of self-reported injury in the 12 months prior to the survey*

<table>
<thead>
<tr>
<th></th>
<th>OR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Nonwhite</td>
<td>1.55</td>
<td>1.10, 2.19</td>
</tr>
<tr>
<td><strong>Immigrant status</strong></td>
<td></td>
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<tr>
<td>Native-born</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Foreign-born</td>
<td>1.51</td>
<td>1.03, 2.23</td>
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<tr>
<td><strong>Occupational grade</strong></td>
<td></td>
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<tr>
<td>High-wage</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Low-wage</td>
<td>1.69</td>
<td>1.10, 2.60</td>
</tr>
</tbody>
</table>

Adjusted for worker age, gender, English spoken at home, hospital site
Vulnerable workers perceive work environment as better and safer

<table>
<thead>
<tr>
<th></th>
<th>Ergonomic practices (higher=better)</th>
<th>People-oriented culture (higher=better)</th>
<th>Unit safe patient handling practices (higher=better)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>P for diff</td>
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<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>3.05</td>
<td>0.84</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Nonwhite</td>
<td>3.41</td>
<td>0.95</td>
<td></td>
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<td>Immigrant status</td>
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<tr>
<td>Native-born</td>
<td>3.06</td>
<td>3.01</td>
<td>&lt;.0001</td>
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<tr>
<td>Foreign-born</td>
<td>3.50</td>
<td>3.38</td>
<td></td>
</tr>
<tr>
<td>Occupational grade</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-wage</td>
<td>3.07</td>
<td>0.85</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Low-wage</td>
<td>3.70</td>
<td>0.83</td>
<td></td>
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</tbody>
</table>
Association between work environment and injury varies by worker vulnerability

<table>
<thead>
<tr>
<th></th>
<th>Ergonomic practices and OR for injury</th>
<th>People-oriented culture and OR for injury</th>
<th>Unit handling practices and OR for injury</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Injury OR 95%CI</td>
<td>Injury OR 95%CI</td>
<td>Injury OR 95%CI</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>0.67 0.56, 0.81</td>
<td>0.69 0.58, 0.82</td>
<td>0.87 0.68, 1.12</td>
</tr>
<tr>
<td>Nonwhite</td>
<td>0.73 0.55, 0.99</td>
<td>0.83 0.60, 1.15</td>
<td>1.25 0.85, 1.83</td>
</tr>
<tr>
<td>Immigrant status</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Native-born</td>
<td>0.63 0.53, 0.75</td>
<td>0.66 0.56, 0.77</td>
<td>0.95 0.75, 1.20</td>
</tr>
<tr>
<td>Foreign-born</td>
<td>0.94 0.67, 1.30</td>
<td>1.12 0.76, 1.64</td>
<td>1.04 0.68, 1.61</td>
</tr>
<tr>
<td>Occupational grade</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-wage</td>
<td>0.68 0.57, 0.80</td>
<td>0.68 0.58, 0.80</td>
<td>1.00 0.79, 1.25</td>
</tr>
<tr>
<td>Low-wage</td>
<td>0.63 0.39, 1.02</td>
<td>1.21 0.71, 2.04</td>
<td>0.94 0.58, 1.55</td>
</tr>
</tbody>
</table>
Summary and discussion

• Vulnerable workers perceive work environment as better and safer than their non-vulnerable counterparts
• Yet their injury rates are higher
• And in some cases, the direction of association between work environmental exposures and injury is opposite in vulnerable and non-vulnerable workers
• What’s going on here?
  – Frame of reference from past jobs?
  – Fear of retaliation?
  – Subtle social exclusion?
Next steps

- Testing for socioeconomic disparities in effectiveness of a 2013 safe patient handling intervention at the hospitals
- Overall injury rate went down, but did injury disparities increase?
Thank you!

Our Shared Goal
Protect and promote worker safety, health, and well-being
http://centerforworkhealth.sph.harvard.edu/

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Relationships between Employee and Resident Well-Being in the Long-Term Care Sector

Laura Punnett, ScD¹; Alicia Kurowski, ScD¹; Ernest Boakye-Dankwa, MSc, MPH¹; Bora Plaku-Alakbarova, MSc¹; Rebecca Gore, PhD¹; Erin Teeple, MD, MPH¹,²; Procare Research Team

University of Massachusetts Lowell¹
Worcester Polytechnic Institute²

CPH-NEW is a NIOSH Center for Excellence in Total Worker Health®
CPH-NEW: Who We Are

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• Industrial Hygiene

UConn
• Psychology
• Health Promotion
Nursing homes function as work and residential settings.

Long-term care work health impacts:
- Physical injury risk
- Stress
- Intention to turnover

Impacts on residents and workers may overlap and interact.

http://www.sunshineretirementliving.com/folsom-retirement-living/
http://www.icprivatesale.com/properties/retirement-home-in-vaughn/

www.uml.edu/cph-new
Integrated Health Care Evaluation

- Facility
- Workforce
- Resident Care Quality and Safety

www.uml.edu/cph-new
**CPH-NEW Nursing Home Cohort**

Single U. S. Nursing Home Corporation
(203 facilities; 13 states)
2003-2013

- **Facility**
  - Beds
  - Occupancy
  - Medicare/Medicaid
  - Specialty units
  - SHRP performance
  - Workers Comp claims

- **Workforce**
  - Job title counts
  - Staff retention rates
  - Management turnover
  - Union status
  - Employee satisfaction surveys

- **Residents**
  - Resident acuity
  - Adverse event rates:
    - Pressure ulcers
    - Falls
    - Weight loss
  - Resident satisfaction surveys

- **CMS Ratings**
  - Survey
  - Quality
  - Staffing

[www.uml.edu/cph-new](http://www.uml.edu/cph-new)
Multiple and multi-level linear regression and simple and multilevel Poisson regression applied to examine relationships between domains:

- Employee satisfaction
- Resident satisfaction
- Resident pressure ulcer rates
- Resident unexplained weight loss
- Resident falls

Plaku-Alakbarova B. Punnett L. Gore RJ. Procare Research Team. Nursing home employee and resident satisfaction and resident care outcomes. Safety and Health at Work (2018); epub 01/08/2018.
Overall employee satisfaction found to be strongly correlated with resident outcomes

- 1-point increase in overall employee satisfaction:
  - 17.4 point increase in resident/family satisfaction (p<0.0001)
  - 19% decrease in combined incidence of resident falls, weight loss, and pressure ulcers (p<0.0001)

Employee satisfaction found to have protective association with annual resident outcomes

- Before and after adjustment for staffing levels
- Before and after adjustment for Medicare and Medicaid day rates
**Methods II**

- **K-means cluster analysis applied to investigate clustered associations among domains:**
  - Safe resident handling program (SHRP) performance
  - Resident care outcomes
  - Employee satisfaction
  - Workers compensation claims rates
  - Resident satisfaction

Results IIa

- Cluster analysis applied to identify homogeneous unobserved distinct subgroups among facilities
  - k=1,2,3,4 partitions
  - k=2 optimal by pseudo F-statistic
  - Variable distributions between clusters were then compared
Results IIb

- Facilities with better patient care outcomes and greater resident satisfaction were also found to have better workforce outcomes:
  - Lower rates of workers compensation claims
  - Better safe resident handling performance
  - Higher employee retention rates
  - Higher rates of employee-reported job satisfaction and engagement

- Employee sick hour rates
  - Only clustering variable not to differ significantly between clusters
  - Greater facility-level sick hour use/FTE significantly (p<0.05) correlated with
    - Higher staff retention rates (RN, LPN, CNA)
    - Lower resident fall rates
    - Greater reductions in workers compensation claims rates following SHRP
Significant associations found between healthcare workforce and resident measures in long-term care.

These findings support the value of integrated analyses of employee and resident domains related to healthcare safety and quality.

Future work will explore temporal relationships between worker and patient measures, and these methods could be applied to other facility administrative data sets.
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Questions?
Protecting Workers in the Booming Home Care Industry:
Workers’ Experienced Job Demands, Resource Gaps, and Benefits following a Socially Supportive Intervention

Ryan Olson, Kelsey Parker, Linda Mabry, Jennifer Hess, Miguel Marino, Sharon Thompson, & Kristy Luther Rhoten
The COMPASS Program

• Integrated elements of effective peer-led social support groups with scripted team-based programs
• Targeted *Total Worker Health*® focused outcomes

(Delbecq et al, 2012; Toseland et al, 1989, 1990; Goldberg et al., 1996 and colleagues)
Randomized Controlled Trial
(April 2013 – Oct 2015)

16 Groups (N = 149)

**COMPASS**
- Baseline (n=75)
- 6 mo (n=55)
- 12 mo (n=54)
- 24 mo

**CONTROL**
- Baseline (n=74)
- 6 mo (n=63)
- 12 mo (n=58)
- 24 mo

Both Groups:
- Survey
- Health Assessment
- Interviews
RCT participants (n=149)

- Female 89%
- Caucasian 74%
- Average
  - 51.6 yrs old
  - BMI 31.9
  - 7.4 yrs home care experience
  - 24.1 weekly work hrs
- 39% depression diagnosis (at some time in life)
Intervention Effects:
Experienced Community of Practice

Green = intervention

\[ d = \text{Effect Size} \]
- Small = .20
- Medium = .50
- Large = .80

\[ * \text{statistically significant} \]

Olson et al. (2016) American Journal of Public Health
Intervention Effects: Safety & Health Outcomes

- Using new tools for housecleaning (6 mo. $d=.51$, 12 mo. $d=.64$)
- Using new tools for moving objects and/or CEs (6 mo. $d=.65$)
- Communicating with CEs about safety hazards (12 mo. $d=.84$)
- Correcting slip, trip, fall hazards (12 mo. $d=.45$)
- Eating more fruits and vegetables (12 mo. $d=.31$)

- 6 mo HDL ($d=.22$)
- 6 mo lost work days due to injury ($d=-.66$)
- 12 mo grip strength ($d=.29$)
- Symptoms/injuries trended downward (ns)

*Consumer-employers independently confirmed significant safety improvements*
Qualitative Interviews (n=26)
Stories of job demands, resources, resource gaps, and experienced support

If you say you're going to be there at 9:00 for someone, you're going to be there at 9:00! Now, if you have a person who's waiting for you and laying in bed because they can't get up by themselves, and you're 20 minutes late, . . . can you imagine -- "I can't get up by myself, and I gotta go to the bathroom. I don't want to wet my pants. . . . I'll be so humiliated!" (Clara, May 19, 2015)

I'm starting to realize that I need some assistance from durable medical equipment . . . There's things my [CE] should be having that would make the care worker's job easier . . . There's days that my [CE] can't stand up and use her legs. (Tate, July 3, 2015)

I had been holding it all in, [but after sharing with my team], I felt good. Sometimes . . . you're just thinking you're going to scream, but you cannot scream. I felt that way . . . I felt like I got rid of something (Olive, May 23, 2015).

Preliminary 24-month Outcomes: Mixed Methods Approach

• Intent-to-treat analyses
  – Community of practice and safety behaviors
    • Mean effect size reduced to d=0.16, ns
    • New tools or techniques for house cleaning
      (d=0.43, p=0.068)

• Qualitative analyses of 24-month interviews: top/bottom quartiles for sustained safety changes (in progress)
  “...that’s too bad that there wasn’t more – the people that really wanted to participate in it at the end of our session, it’s too bad that there wasn’t another group to go further.”

• Moderation analyses
  (to be guided by qualitative findings)
Take Home Points
we are hiring!

olsonry@ohsu.edu

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OR Home Care Commission
SEIU Local 503

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Thuan Nguyen

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Annie Buckmaster

**Co-Investigator**
Diane Elliot

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Afsara Haque
Faith Raspante
Colleen Hunter
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