Documenting Amount of Manual Handling Performed by Nurses in a Hospital Setting

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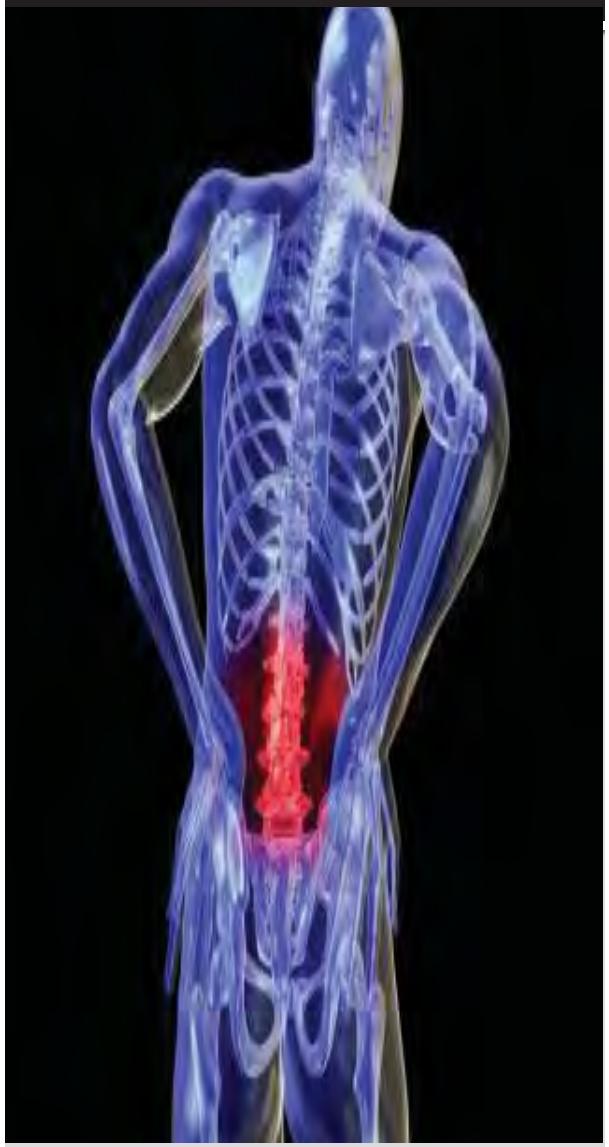
Introduction



- Musculoskeletal Disorders (MSDs) leading injury to nurses (BLS 2010)
- Strong link between patient handling and MSDs (Smedley, et al 1995)
- Limited evidence on other types of handling such as medical equipment
- Research on the amount of lifting has been primarily based on nurses' perceptions (Trinkoff, 2003)

Physical Demands of Nursing

- Heavy lifting of excessive weight when repositioning and transferring patients
  - Oftentimes greater than 50 kg
  - Not a compliant load
  - No handles
- Other duties may aggravate MSD injuries
  - Lifting/holding patients' limbs
  - Reaching for medical supplies
  - Lifting/moving medical equipment
  - Walking and standing constantly

Comparison to Lifting Standards

- NIOSH Safe lifting limit under ideal conditions = 23 kg
- Average patient weight > 50 kg
  - Lifting a patient is far from ideal
- US prevalence rate of obesity at 26.7% will transfer to the patient population (CDC, 2010)
- Patient weight trending above 100 kg

General Trends in Nursing

- Physical stress = high turnover rates
- Number of nurses ≠ growing demand
- Shortage increases accident and absenteeism rates
- Shortage = economical strain on healthcare industry
- Average hospital loses an estimated $300,000 per year for every percentage increase in annual turnover rate

What Are We Missing?

- Lack of objective measures of patient handling activities
- Lack of quantification of handling of medical devices
  - Non-patient handling activities
- Better understanding of the mismatch between subjective assessment and reality

Study Objective

- Determine the prevalence of the different types of patient and equipment handling activities
- Identify prevalence of using lift assist devices during patient handling
- Compare objective and subjective assessments of patient handling activities

Hypothesis 1

- Nurses have a high prevalence of physically demanding manual lifts including transferring and repositioning of patients as well as medical equipment in a hospital setting

- *Specific Aim 1*: Quantify the amount of time spent performing lifting tasks through direct observation

Hypothesis 2

- Nurses have a low prevalence of using lift assist devices when repositioning and transferring patients in a hospital setting

- *Specific Aim 2*: Quantify the amount of time spent utilizing lift assist devices through direct observation

Hypothesis 3

- Estimates of physically demanding lifting are significantly underestimated by subjective assessments of the nurses

- *Specific Aim 3*: Obtain subjective perception of the amount of lifting performed by the nurses through a short survey

Methods

Approach

- Direct observation during one 12-hour shift
- Full-time nurses recruited from University of Cincinnati Hospital
- Three units
  - MICU, SICU, NSICU
  - Expected to have high level of handling activities
- Incentives: $50 Visa gift card

Participants

- 27 nurses volunteered to participate
  - 17 nurses met study requirements
  - Scheduling issues resulted in drop-out of 5 nurses
- 12 full-time nurses 8 female and 4 male
- All were Caucasian
- Average age: 32 years (s.d.=11.07)
- Average years in nursing: 4 years (s.d.=4.72)
- Average years working in current position: 3 years (s.d.=3.08)
- Height: 170.2 cm (s.d.=8.5)
- Weight: 76.4 kg (s.d.=19.8)

Direct Observation

- Observations completed from a distance to ensure medical care is not interrupted
- Assessed the frequency of performing various patient handling activities as well as handling of medical equipment
- Recorded Activities
  - Transfer of patient from bed to chair
  - Reposition patient in bed
  - Reposition Equipment
  - Lift patient from floor to other location

Subjective Observation

- Survey was completed at the end of shift by the nurse
- Measured how often nurses completed various patient and medical equipment handling tasks
- Survey Activities
  - Transfer of patient from bed to wheelchair or stationary chair
  - Transfer patient to lift assist device
  - Reposition patient in bed
  - Reposition Furniture and Equipment
  - Lift patient from floor to other location

Symptom Survey

- Discomfort survey was completed at the beginning and end of the shift
  - 0 = None 1-3 = Mild 4 – 6 Moderate 7 – 10 Severe
- Body Regions
  - Neck, Shoulder, Elbow, Hand and Wrist, Upper Back, Low Back, Hip, Knee, Lower Leg & Foot

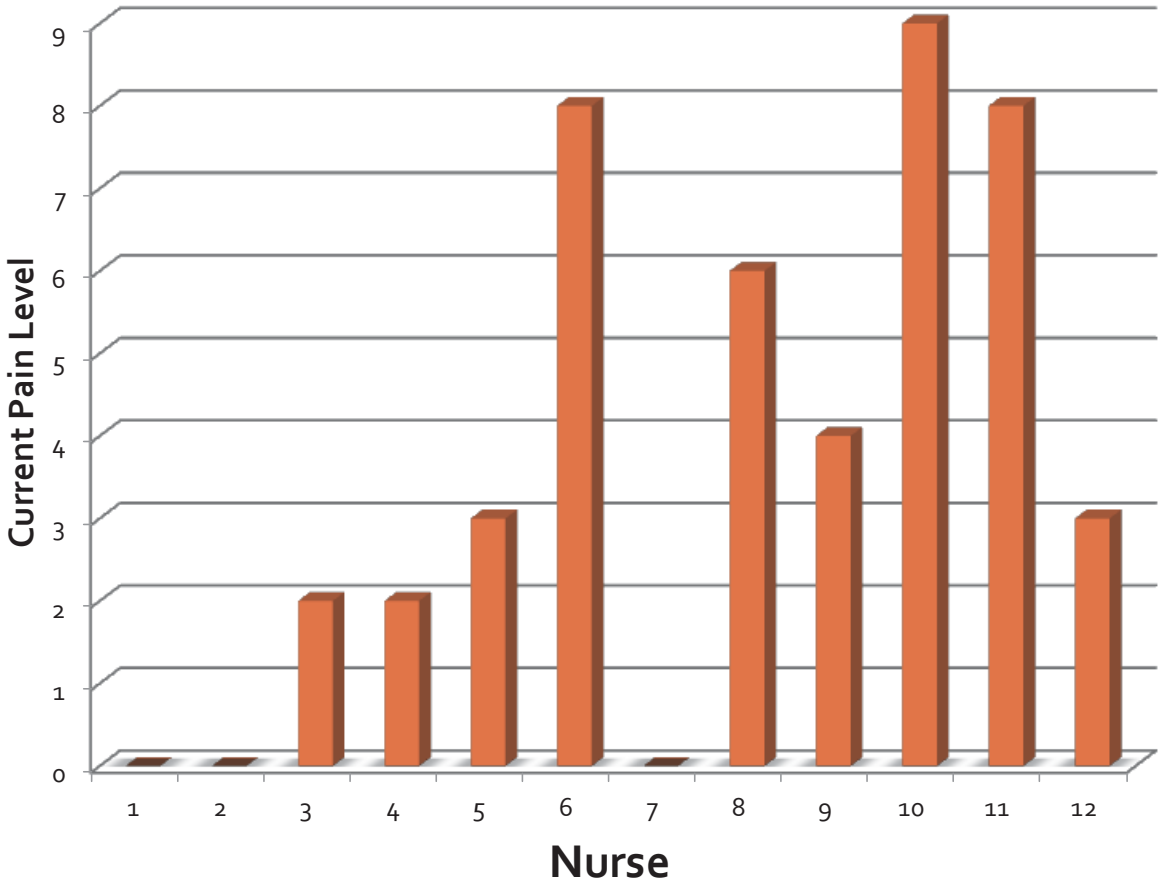
Statistical Analyses

- Frequencies and means were computed for the appropriate outcome variables
- Reported individual pain levels as a function of body region

Preliminary Results

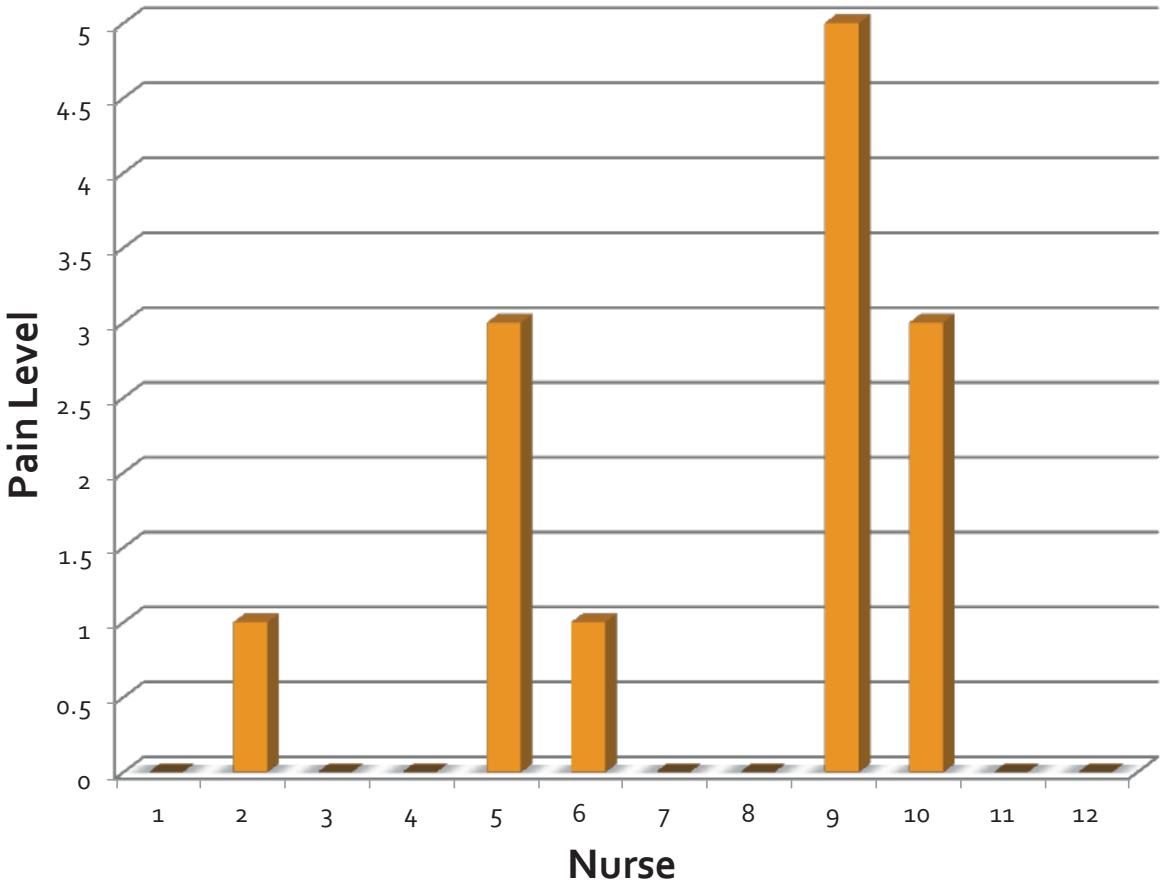
Low Back Pain

- **75%** reported pain in the lower back
- **42%** reported lower back as moderate to severe



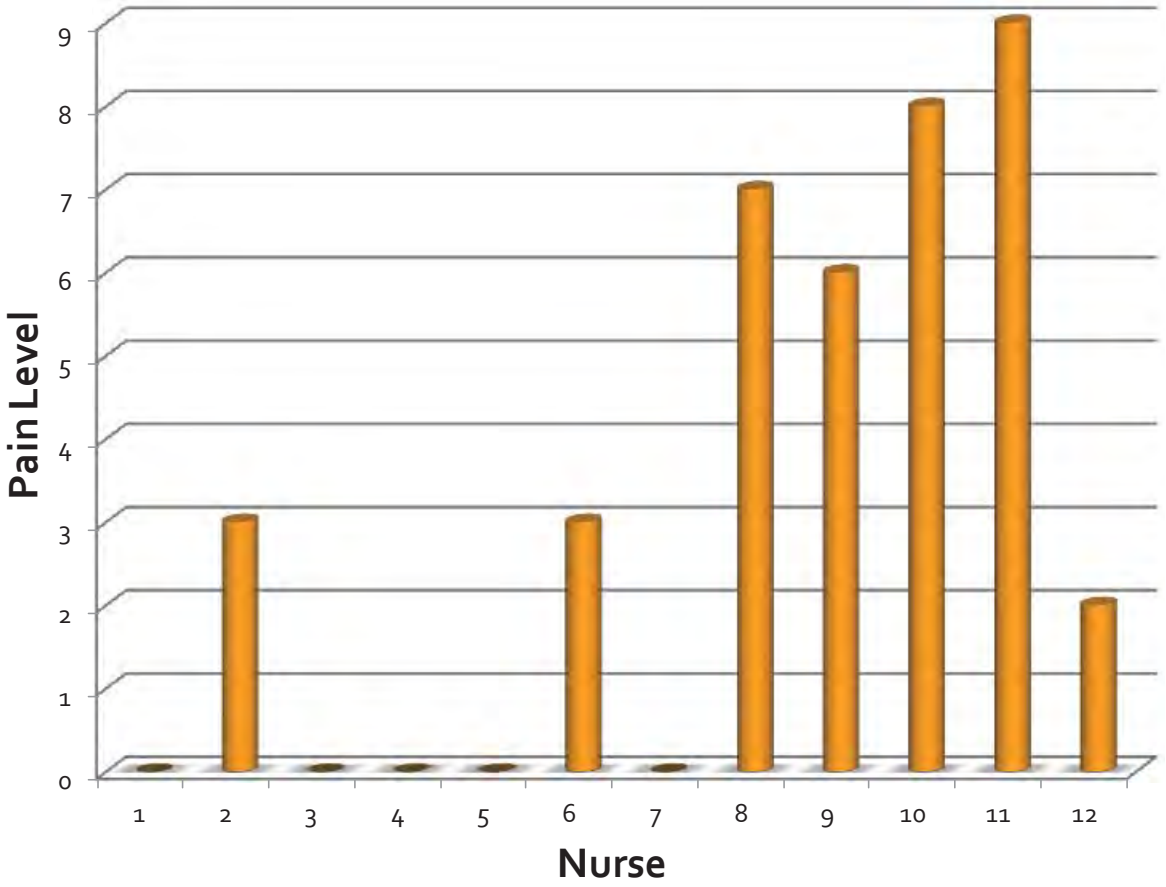
Shoulder Pain

- **42%** reported pain in the shoulder area
- **25%** reported pain as moderate to severe



Lower Leg & Foot Pain

- **58%** reported pain in the lower leg and foot
- **33%** reported pain as moderate to severe



Objective Handling Activities

- Nurses manually handle patients and equipment an average of 50 times during a 12-hour shift
  - Average of 8 patient transfers
  - Average of 30 times repositioning of patients
  - Average of 12 times handling of equipment
- Lifting assist devices were utilized 7% of the time

Subjective Handling Activities

- Perception survey – nurses manually handled patients and equipment an average of 15 times during a 12-hour shift
  - Average of 3 patient transfers
  - Average of 7 times repositioning of patients
  - Average of 5 times handling of equipment

Study Limitations

- Single shift observations: required 12-hours of monitoring, potential sampling bias
- Patient load is highly variable: scheduled observation may not reflect an average day
- All observations were in ICU locations: other units probably have different handling demands
- Single adult hospital: culture and patient size potentially impact handling practices

Study Limitations

- Demographics of participants were limited: Need more diversity with respect to gender, race, and ethnicity
- Nurses extracurricular activities unknown: non-patient activities could contribute to the pain and injuries

Future Direction

- Larger sample populations and locations: larger study will improve generalizability and statistical power
- Multiple observations: increase the confidence of the observations
- Account for other MSD risk factors: study focused on handling activities in hospital only
- Investigate the lack of utilizing lift assist devices: Need to understand why effective interventions are not being used

Take Home Message

- Based on preliminary results…
- Nurses underestimated the amount of manually lifting performed during their shift
- Utilization of lift assist devices were limited
- Patient handling dominated activities but handling of equipment was also prevalent

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