Preserving the Bedside Nurse: Grip Strength and Orthopedic Problems Among Nurses and Nursing Students

INTRODUCTION

- Nurses are essential healthcare professionals in a physically demanding role
- Although the physical demand for nurses is known not enough is done to ensure physical capabilities
- Grip strength has been used in other disciplines to measure physical health and likelihood of injury
- A small number of studies examine grip strength among nurses

MATERIALS & METHODS

- A cross-sectional study was conducted
- Sample of (N = 271) nursing staff and students
- Survey of work-related demographics
- Exercise habits
- Perceived Stress Scale-4
- Nordic Musculoskeletal Questionnaire
- Height and weight with body mass index (BMI)
- Grip strength - JAMAR hydraulic dynamometers
- Grip strength was compared to normative values by age and gender

BACKGROUND

- Nurses rank highest in workplace injuries among healthcare workers
- Nearly half of nurse injuries are attributed to physical over exertion
- Most injuries occur in the hospital setting

RESEARCH QUESTIONS

- How does grip strength among nurses compare to the general population?
- Is grip strength associated with orthopedic injuries among nurses and nursing students?

RESULTS cont’d

- Grip strength among participants with and without orthopedic problems significantly differed between genders (p < 0.001)
- Orthopedic problem – Females 82.7% (n=191)
  – Males 17.3% (n=40)
- Age and BMI were not significantly associated with orthopedic problems (p=0.339, p=0.558)
- Exercise level significantly differed among participants below or meeting grip strength normative values (p=0.001)
- Exercising <2.5 hours/week, 73.8% (n=93) were below national grip strength average
- Exercising >2.5 hours/week, 57.3% (n=55) were below average
- Age and BMI were not significant with (p=0.233, p=0.933)

MULTIPLE LOGISTIC REGRESSION ANALYSIS OF THE RELATIONSHIP BETWEEN GRIP STRENGTH AND ORTHOPEDIC PROBLEM

- The odds of orthopedic injury are 2.22 times higher for individuals with below average grip strength, compared to those with average or greater grip strength
  (OR 2.22 95% CI:1.93 - 7.89)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Odds Ratio (95%CI) a</th>
<th>Odds Ratio (95%CI) b</th>
<th>Odds Ratio (95%CI) c</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grip Strength Category (below vs meets national average)</td>
<td>2.17 (1.18 - 4.00)</td>
<td>1.96 (1.00 - 3.84)</td>
<td>2.22 (1.14 - 4.31)</td>
</tr>
<tr>
<td>Gender (Female vs. male)</td>
<td>3.91 (2.05 - 7.46)</td>
<td>3.60 (1.79 - 7.24)</td>
<td>3.90 (1.93 - 7.89)</td>
</tr>
<tr>
<td>Age (years)</td>
<td>0.99 (0.96 - 1.01)</td>
<td>0.98 (0.96 - 1.01)</td>
<td>0.98 (0.96 - 1.01)</td>
</tr>
<tr>
<td>BMI</td>
<td>1.01 (0.96 - 1.07)</td>
<td>1.00 (0.93 - 1.08)</td>
<td>1.01 (0.94 - 1.08)</td>
</tr>
<tr>
<td>Level of Exercise (below vs meets recommended 2.5 hr/wk)</td>
<td>1.29 (0.67 - 2.48)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exercise intensity(Low vs. High)</td>
<td></td>
<td>1.36 (0.48 - 3.80)</td>
<td></td>
</tr>
<tr>
<td>Exercise intensity(Medium vs. High)</td>
<td></td>
<td>1.41 (0.62 - 3.19)</td>
<td></td>
</tr>
</tbody>
</table>

a. Adjusted for age gender and BMI
b. Adjusted for age, gender, BMI, & level of exercise
c. Adjusted for all factors except level of exercise

CONCLUSIONS

- Orthopedic injuries are more than twice as likely for nursing staff and students with below average grip strength
- Further research is warranted, as well as intervention development
- Educating nursing staff and students on exercise lifestyle changes could prevent personal injury, increase career longevity, and job satisfaction, while also improving patient care

AUTHORS

Robert Semakula PhD Student, Robert Harrity PhD Student, Elizabeth Romero, Xochitl Torres, Salem Dehom, Ellen D’Errico, Lisa Roberts

Factors

- Preserving the Bedside Nurse: Grip Strength and Orthopedic Problems Among Nurses and Nursing Students

PI contact: Dr. Lisa Roberts, lroberts@llu.edu