A Physical Workload Index to Evaluate a Safe Resident Handling Program for Clinical Staff in Nursing Homes

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Objective

- A comprehensive analysis of physical workload of nurses and nursing assistants was conducted in long-term care facilities in order to evaluate effectiveness of the worksite’s Safe Resident Handling Program (SRHP).
- Physical workload was assessed using a biomechanical physical workload index (PWI) which combined compressive forces on the spine resulting from postures and manual handling.

Methods

- Each combination of body posture and manual handling that was observed required a weighting factor, resulting from the compressive forces on L5/S1.
- Each weighting factor was multiplied by a scoring factor, reflecting the frequencies of PATH variables collected.
- The observed frequencies were placed on a scale from 0 to 1.
- Informed by a prior index, contributions were summed to obtain total physical loads for each job group; then compared across five time periods.

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PWI = \sum_{i=2}^{5} W_{Ti} \times S_{Ti} + \sum_{j=2}^{3} W_{Aj} \times S_{Aj} + \sum_{k=3}^{7} W_{Lk} \times S_{Lk} + \sum_{l=1}^{3} W_{Wul} \times S_{Wul} + \sum_{m=1}^{3} W_{Wim} \times S_{Wim}
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- W = weighting factor
- S = scoring factor

Introduction & Background

- Manual handling of residents leads to increased lumbar loading in nursing home workers, resulting in a high rate of low-back injuries and other MSDs.
- Nursing assistants perform the majority of direct care, exposing them to repeated trunk flexion and heavy manual handling which may increase their rates of low-back injuries.
- This study examines a SRHP intervention in a large nursing home corporation.
- Installation of resident handling equipment
- Policies for staff training
- Procedures for equipment maintenance
- Ergonomic exposures of clinical staff in 13 nursing homes were observed at 60-second intervals using the PATH (Postures, Activities, Tools, & Handling) method.
- Inputs for the PWI were obtained from PATH observations made in an actual workplace setting.
- Other studies of biomechanical modeling of clinical work have been based on inputs gathered under simulated conditions in laboratory settings.

Results

- Nursing Assistants: workload increased slightly at three months, then decreased steadily at the 12, 24, and 36-month follow-ups
- While Resident Handling: trend more pronounced
- Nurses: slight decrease observed, but PWI did not change much

Discussion/Conclusions

- The results of this study quantify and standardize the effectiveness of the SRHP intervention.
- The SRHP yielded decreasing PWI scores for all jobs; the decrease was particularly dramatic during resident handling tasks.
- This pattern is consistent with trends observed for the frequencies of body postures and manual handling when individually examined.
- Nurses spend considerably less time handling residents than nursing assistants and have infrequent contact with lifting equipment, therefore the SRHP is unlikely to have much impact on nurses’ physical workload.
- The observed PWI measures are consistent with this.
- Further examination of the PWI could provide insight into threshold levels for injury prevention

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