

Patient Mobility in Hospital Beds With and Without Side Rails

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Background: The use of hospital bed side rails for increased mobility and safety for elderly and high fall risk patients has become a controversial topic. The suggested removal of side rails to prevent entrapment, as recommended by Consumer Federation of America, increases the risk that a patient may fall out of the bed. Additionally, without side rails, patients may require additional assistance from nurses to reposition patients in bed, which increases the risk of back injuries among nurses (Jang et al. 2007).

Objective: To examine the biomechanics associated with a patient's ability to move freely in bed with and without side rails.

Methods: Biomechanical data for in bed movements from fifty-two older adults with a history of falls (Morse Fall Scale value >45) (mean age=68 years, SD=11.4) was analyzed. An 18-camera motion tracking system (NaturalPoint, Corvallis, OR) was used to track body biomechanics. Participants were instructed to lie down on an instrumented hospital bed. They were then instructed to turn onto their right side, then onto their left side. This was performed three times with three different side rail configurations; rail 1, rail 2 and no rails. After each turn, distance of the pelvis from the edge of the bed and maximum rotation of the pelvis were quantified. A one-way ANOVA was used to examine the relationship of these variables between side rail conditions.

Results: There was no statistical difference detected in distance from the pelvis to the edge of the bed between side rail conditions ($F(2,181)=1.576$, $p=0.210$). The mean maximum pelvic rotation was 70.0 degrees (SD=14.7) for no side rails, 73.7 degrees (SD=12.2) for side rail 1 and 72.5 degrees (SD=11.4) for side rail 2. A significant difference was found between the three side rail configurations for pelvic angle for a right side turn, $F(2,270)=4.693$, $p=0.010$. Post Hoc analysis found significant differences between no rails and both side rail 1 ($p=.003$) and side rail 2 ($p=.014$).

Conclusion: The current results indicate that participants accomplished a more complete turn with side rails and demonstrated that the presence of a side rail is useful for patients to use while turning when lying in bed.

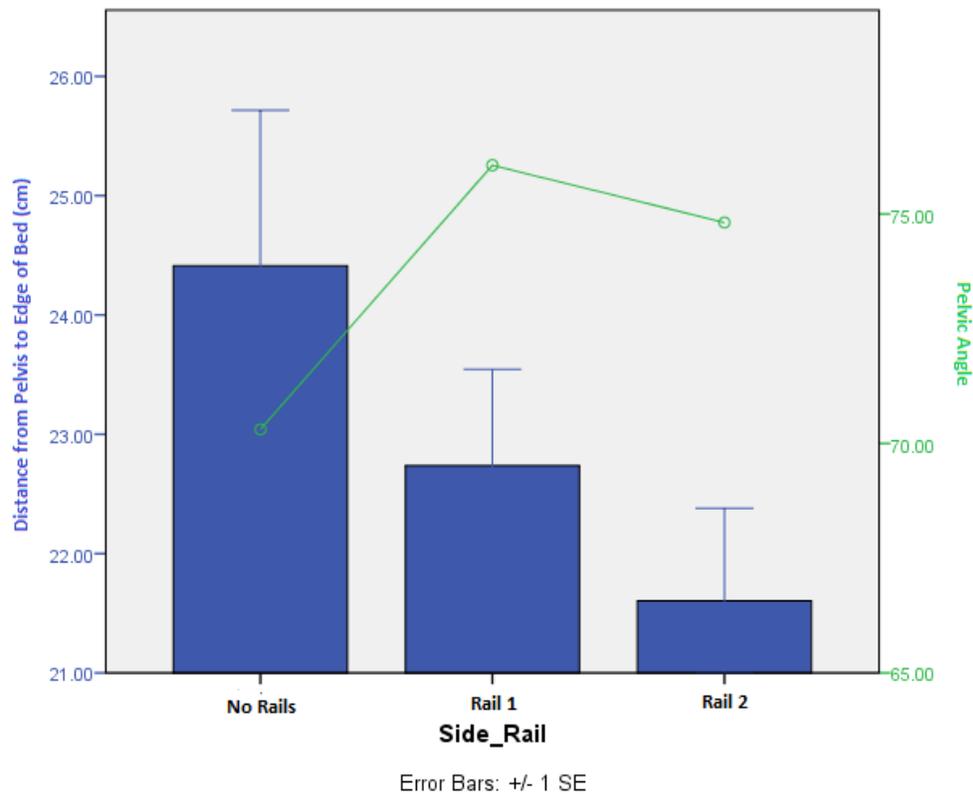


Figure 1- Pelvic angle and distance to edge of bed for a right side turn

References

Jang, R., Karwowski, W., Quesada, P. M., Rodrick, D., Sherehiy, B., Cronin, S. N., & Layer, J. K. (2007). Biomechanical evaluation of nursing tasks in a hospital setting. *Ergonomics*, 50(11), 1835-1855.

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