Development of a Simulation and Internet Based Pilot Intervention to Evaluate Adherence to a Patient Transfer Protocol in the Real World Environment

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INTRODUCTION

• Nursing back injury is epidemic: The average age of nurses is > 45 with 80% expected to have at least 1 significant back or musculoskeletal injury during their career. Nursing personnel are # 2 behind truck drivers in work related musculoskeletal injury (Bureau of Labor Statistics 2002).

• Financial impact: Nationally, the cost of nursing injury is estimated to be billions of dollars with 5% of patients responsible for up to 95% of overall expenditures.

• Key barriers to safe and effective moves: Inadequate orientation or lack of on-going training; perception of inadequate time, tools or people; physical fitness of staff; failure to assess patients’ ability or engage them to help; lack of knowledge of true toll of injury.

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RESULTS

• Protocol steps were developed through expert consensus as well as referencing to practice standards or best evidence.

• Coders were trained by experts across 10 transfer events in the clinical environment

• Cohen’s kappa was calculated for each of the 10 protocol steps with mean of 0.62 (range 0.43- 0.83) indicating substantial inter-rater agreement across the protocol.

METHODS

• Primary Aim: To improve direct patient care personnel skills and adherence according to a 10 point transfer protocol using an internet and simulation-based training program.

• Design: Prospective educational intervention conducted as a pilot study at the University of Pittsburgh and the University of Pittsburgh Medical Center (IRB# 0511041).

• Hierarchical Task Analysis: Deconstructed transfer processes in consultation with certified ergonomic experts and direct care providers. Developed a universally applicable 10 point protocol to be used as a primary measurement instrument.

• Transfer Data: Observed and scored transfers on four nursing units of the UPMC Institute for Rehabilitation and Research at UPMC South Side and UPMC St. Margaret and also during simulation training scenarios at WISER.

• Data Collection: Automated through use of HP IPAQ™ devices, Laerdal SimMan™ log files and through the WISER Simulation Information Management System (SIMS).

• Improved Knowledge

  • Used a classic pre-test, post-test design
  • 10 quiz items administered (pre & post)
  • Paired t-test compared pre & post %
  • N= 67 pairs, t_{65.00} = - 11.21, p ≤ 0.0004

• Improved Simulated Skills

  • 19 teams with each team performing 4 simulated moves (2 ‘cold’ & 2 ‘hot’)
  • Paired t-test compared pre and post %
  • N=19 pairs, t_{66.00} = - 11.21, p ≤ 0.0004

• Improved Real World Skills

  • Observed real world patients transfers (n= 206) with observation at three time points (pre-intervention, 4 wk, 12 wk)
  • Significant improvement in transfer skills observed at 4 week time point on intervention unit (p ≤ 0.0004)

CONCLUSIONS

• Curricular Effectiveness: Internet curriculum combined with hands on training using a low fidelity simulator (Laerdal Tut Kelly Move Mannequin™ + structured protocol was effective for improvement of knowledge. Improved transfer skills were demonstrated across the protocol and in each 10 point transfer protocol step.

• Satisfaction: Subjects reacted positively and demonstrated a high level of satisfaction with the intervention both at the end of the simulation training and at the 4 week follow-up measurement point.

• Retention: Follow-up real world patient transfer observations at 4 weeks demonstrated significant improvement from baseline in adherence to the steps of the 10 point protocol. Observations at 12 weeks demonstrated regression toward baseline. However no definitive conclusions could be reached as unit personnel turnover closely paralleled reduction in adherence.

• Tools: Hand held computer units with data entry via a Graphic User Interface (GUI) allowed unobtrusive data collection in both the simulation laboratory and the clinical setting.