Human Factors System Approach to Identify Factors that Affect the Adoption of Ergonomic Technology in Healthcare

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Abstract

The rising prevalence of work-related musculoskeletal disorders (MSDs) among healthcare professionals and practitioners is alarming. Patient handling is the most prevalent cause among these cases. Despite new technologies being available to nursing personnel, such as patient lifting devices, many studies have reported that healthcare personnel often choose not to use lifting equipment to perform daily transfer task. Multiple work system barriers have been identified that impact caregivers decisions to utilize this equipment, these include: time and effort to locate and set up equipment, social pressures to perform task quickly, inadequate training, poor equipment design, and ease of use. The SEIPS (Systems Engineering Initiative for Patient Safety) model of work system and patient safety is a human factors systems approach that has been successfully applied in healthcare research and practice. In this paper we use the SEIPS model to understanding the structures, processes, and outcomes in health care and their relationships, to gain insight on potential factors that predict caregivers' intention to use and adoption of new ergonomic technologies. A semi-structured interview protocol was developed that asked participants questions related to their work system to collect baseline data. Based on these findings, a more enhanced study with a larger set of sample measures related to healthcare work system and technology acceptance factors will analyzed to improve quality and safety of care.

Biographies

Brittney Jimerson is a Ph.D. Candidate at North Carolina A&T State University. She graduated from North Carolina A&T State University with a M.S. in Industrial and System Engineering in 2013. She was an undergraduate research scholar and earned her B.S. in Industrial Engineering and Management from the University of North Carolina at Asheville in 2009. She is an Alpha Pi Mu Engineering Honor Society Member, NSBE member, and IIE member. Her research interest include quality assurance, engineering ethics, human performance modeling, and human computer interaction.

Dr. Eui H. Park, Professor of the Department of Industrial and Systems Engineering (ISE) at North Carolina A&T (NC A&T) State University, received his Ph.D. from Mississippi State University in 1983. Upon completion of his Ph.D., he joined NC A&T and has since initiated and developed a successful Human-Machine Systems Engineering program and interdisciplinary manufacturing program. He has also conducted STEM outreach programs, the Para-Research Program, Partnership in Education and Research, REU, and RET, for the past sixteen years. He is the founder of teaching factory, Piedmont Triad Center for Advanced Manufacturing. Dr. Park was also the Chairperson of the ISE Department for sixteen years from July 1990. He has been an IIE Fellow since 2000. His research interest include Human-Machine Systems Engineering and Quality Assurance. He has been a principle investigator in 24 awarded funded research projects totaling over $12 million in the past ten years.

Dr. Steven Jiang is an Associate Professor in the department of industrial and systems engineering at NC A&T State University. His research interests include visual analytics, human performance modeling, and human computer interaction. He has published more than 20 peer reviewed journal papers and more than 70 conference papers.