Chapter 12
Two Case Studies in Human Factors in Healthcare:
The Nurse and Older Patient

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ABSTRACT

The delivery and consumption of health care services and information is in rapid change due to the introduction of technology, socio-political considerations (in the United States), and the change in population demographics (i.e., the "baby boom generation"). This chapter discusses some of these trends and their implications for two specific stakeholders in the health care system: the nurse and the older patient. In two case studies the authors report on the application of human factors methods to better understand the role of the built-environment on nursing work and the role of technology acceptance issues in older adult usage of electronic personal health records. The authors hope to show that while the challenges are great, the application of human factors methods can help increase performance, safety, and satisfaction for both nurse and older patient.

INTRODUCTION

Changes in population demographics, technology, and a need to reduce costs in healthcare delivery are affecting the ways in which healthcare personnel and patients carry out their tasks. This change, at least in the United States was spurred, among other things, by the Institute of Medicine's report, "To err is human" which shed light on the extent of

DOI: 10.4018/978-1-60960-177-5.ch012

medical errors in hospitals affecting both personnel and patients (Kohn, Corrigan, & Donaldson, 2000). Follow up initiatives have aimed toward reducing adverse events such as medical errors as well as improving safety for both patients and caregivers. Since 2008, costs associated with adverse events such as falls or medical errors can no longer be paid by secondary payers. If an adverse event occurs in a hospital, the hospital is financially responsible. This has caused healthcare systems to review healthcare delivery processes in an effort to reduce errors, improve quality, maximize efficiency, and effectiveness all while reducing costs.

Hospital personnel expenses make up more than fifty percent of a hospitals operating budget according to the American Hospital Association (American Hospital Directory, 2009). To reduce costs, it is imperative for hospitals to streamline common procedures and processes so that existing staff can optimize their clinical tasks involving care delivery. Optimizing healthcare processes requires fundamental changes in the way that stakeholders carry out their tasks, and human factors can assist through conducting tasks analyses of key nursing tasks

The purpose of this chapter is to discuss two very different stakeholders. First, nurses are directly and indirectly affected by the healthcare environment and clinical tasks that support care delivery. Nurses report among the highest levels of job dissatisfaction and burnout of any occupation (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002). This may be partly due to the demands of the job and task design. One consequence of overburdened nurses is that patients may start to be more self-sufficient in health matters because of possible reduced time with the provider. Every visit may soon require patients to be even more informed than usual (e.g., looking up health conditions, increased awareness of their own health information). This has a direct impact on the older adult patient, the second stakeholder discussed in this chapter, who is trying to maintain their health. New technologies hold great promise for easing simple record-keeping, as well as advanced decision support and maintenance of chronic conditions. However, barriers prevent widespread adoption by older adult patients.

While each problem (nurse's work and the older e-health patient) varies dramatically in users, environment, and task we hope to show that each problem can be approached from a human factors perspective. First, we briefly review some common human factors and usability methods designed to better understand the needs of the user and the demands placed on them by the task and environment. Our goal in discussing these two case studies is to show how some of these methods may be used to help solve two specific healthcare-related problems.

With both stakeholders, we take a human factors approach to understanding two issues: the nurse's interaction with a patient headwall and the older patient's acceptance of web-based medical records. In both examples, we discuss the user (their needs, problems) and the system (demands of the task). Both projects are still in various stages of progress but should sufficiently illustrate how complex problems can be studied. In the next sections we discuss several widespread trends in healthcare that affect both the nurse and older patient.

BACKGROUND

Nurses and the Nursing Shortage

Depending on the region of the United States and various parts of the world, there is a major shortage of registered nurses caring for patients despite the current recession. A recent study estimates that there will be shortage of 260,000 registered nurses by 2025 (Buerhaus, Auerbach and Staiger, 2009). This same study suggests that while the nursing shortage may be alleviated by recent economic conditions, it will still be present come 2018.