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Human Factors Science: placing people at the center of healthcare

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Human Factors Science (HFS) is a multidisciplinary effort to understand the interactions among people and their work setting. It takes into account human capabilities and limitations and strives to create systems that provide optimal performance and human well-being. In the healthcare setting, HFS can produce more effective, efficient, and safe care, as well as improved healthcare worker morale.

THE EVOLUTION OF HUMAN FACTORS SCIENCE

Growing industrialization during the 19th century prompted efforts to improve worker safety and health. A more systematic approach to worker health became known as ergonomics ("science of work"), first defined by Jastrzebowski.[1] Over time, other disciplines such as behavioral psychology, industrial engineering, and safety science brought additional perspectives to these endeavors. As the field evolved, there was a shift in focus from the individual worker to the work system. Developing better systems proved more effective at reducing injuries than depending only on improving workers through additional training. Industries such as aviation and maritime commerce showed remarkable improvement using HSF strategies.

HEALTH FACTORS SCIENCE AND HEALTHCARE

HFS offers a new approach to an old challenge for physicians: how to improve the outcomes and safety of healthcare. Early attempts to improve the processes and outcomes of healthcare followed a different trajectory than other industries. When errors or injuries occurred, the initial response was to "name, blame, and shame" the responsible clinician, often in the form of punishment for the offending doctor. For example, the Code of Hammurabi directed that surgeons who caused a patient to lose an eye would have their hands cut off or pay a fine, depending on the status of the patient. Later, malpractice claims or professional discipline became the more usual methods to improve practice. Risk management approaches were eventually developed from analyses of bad outcome cases to instruct practitioners on how to avoid those outcomes, without much effect on error rates. A more proactive approach in the form of guidelines arose during the 1980s. Guidelines were initially based on expert opinion but increasingly relied on systematic reviews of the medical literature as the evidence-based medicine movement took hold.

While considerable effort and expense were dedicated to guidelines development, their impact on actual practice was disappointing. In many ways, the disappointment with guidelines gave way to the patient safety movement, which continued to rely on literature reviews and expert opinions. The problem with literature reviews was that the quality of the medical literature is uneven at best and irrelevant at worst when it came to the specific patient seeking care.[2] Expert opinions could rarely anticipate the unique context of that patient. The search for more effective approaches to changing practice behavior led to the introduction of HFS into healthcare. Higher risk specialties such as anesthesia, obstetrics, and surgery were the first to make use of HFS strategies and tools, with improvements that were often quite dramatic.[3]

There have been initiatives in primary care to improve care using elements of HFS.[4] One example is the use of team-based learning to improve outcomes in obstetrical emergencies.[5] The Advanced Life Support in Obstetrics (ALSO) has been shown to reduce maternal mortality in a variety of settings, from low to high-income countries.[6]

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THE FUTURE FOR PRIMARY CARE PRACTICE IMPROVEMENT IS HUMAN FACTORS SCIENCE

The World Health Organization Global Patient Safety Plan 2021-2030 identifies HFS as essential for achieving the Strategic Objectives of the Plan.[7] The multidisciplinary nature of HFS provides new approaches for helping primary care practices make effective change. For example, Crew Resource Management (CRM) has proved successful in reducing airline accidents. Similar improvements in team functioning can be achieved in primary care using CRM principles.[8] The challenge in primary care is to help family doctors become aware of HFS,[9] to provide training in HFS,[10] and to promote tools and successful examples of HFS in primary care.[11]

HSF holds more promise than previous efforts to improve healthcare in that it takes a holistic approach, involves the entire healthcare team, offers the methods and skills for those providing care to make more effective and enduring change, and starts with the practice rather than being handed down by health system leaders. The World Organization of Family Doctors (WONCA) is developing a global project to turn the promise of HFS into the reality of better patient outcomes and improved health worker morale.

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