What are clinical human factors?

Clinical human factors has been defined as the enhancement of clinical performance through an understanding of the role of organisation culture, teamwork, skills and knowledge, tasks, work environment design and how these affect human behaviour and abilities in the workplace. (1, 2)

What does it offer patient safety?

Tools and interventions designed to enhance non-technical skills (e.g. skills not directly related to technical expertise but crucial for maintaining safety) such as Crew Resource Management (CRM) and increased use of standardisation have begun to be applied in health care. Research on CRM has reported improved outcomes through improving shared decision-making and teamwork, increasing levels of nurse retention, and improving inter-professional communication. (3)

Organisation culture

The influence of attitudes and behaviours is of concern as risky behaviour can appear to become normalised. The way to tackle this cultural drift is to ensure that everyone recognises and accepts patient safety is the organisation’s first priority. Senior nursing managers can play a role in ensuring the development of a safety culture by being attentive to four dimensions of culture: the system dimension (risk management, management support, leadership, incentivising safety); the personal dimension (adequate knowledge, skills and information); the task-associated dimension (values and beliefs, observable safety behaviours and attitudes towards safety); the interactive dimension (communication, learning from failure, and partnerships in care). (4)

Teamwork

The lack of attention to teamwork in healthcare may be due to a culture which privileges individual autonomy and where effective team performance is inhibited by power relations that exist between different professional groups. (5) Ineffective team skills and behaviours can lead to poor communication, conflict between different providers and failure to develop contingency plans in the event of complications. A values-based approach to teamwork argues that psychological strategies are important in changing individual attitudes and behaviours towards patient safety. (6) Recent developments suggest that team leadership should focus on those who have the necessary education, knowledge and skills to be effective team leaders not necessarily seniority or status. Team leaders need appropriate training and experience to be able to direct team activity, provide guidance and support to individual team members, and to motivate and encourage the whole team through their own positive behaviours and the provision of feedback. (6)

Skills and knowledge

CRM was first used in the aviation industry where it was used to help aircrews develop their understanding of how cognitive errors can occur when stressors such as fatigue, overwork and emergency situations are encountered in the workplace. CRM requires organisations to view errors as being inevitable and endeavour to develop strategies to manage errors. Its critical components include situation awareness; problem identification; decision-making, workload distribution, time management and conflict resolution. Teams engaged in CRM also reported sustained changes in both team and safety climate and improvements in individuals’ ability to recognise stress, recognise adverse situations, manage a team, provide feedback on performance, and manage fatigue. Barriers to CRM have been identified as cost, lack of open discussion about errors, tolerance of detrimental behaviours, and fears over loss of individual and professional autonomy and authority. (6, 7, 8)

Technology and Tools

The human factors literature has identified a range of issues linked to the mismatch between the task, the user and the device or equipment which can lead to failures in safety. In discussing the potential for design- or equipment-related errors some literature has espoused the need for more training, although no amount of training can compensate for poor or flawed design. Standardization of labelling, equipment, devices and documentation together with the use of checklists could reduce patient safety errors. Human factors expertise should be available in the design process and nurses should play a major role in design of systems. (9)
Work environment

Work environment factors including poor lighting, interruptions and noise have been identified as contributing to patient safety failures. These can affect the way information is processed and shared during highly stressful care situations. The physical environment has also been identified as a potential threat to patient safety due to the ways in which equipment is located or stored, the location of bathrooms and bedrooms, the width of corridors and walkways, the level of toilets, wash basins and call bells, and whether or not injury might occur as a result of having to move equipment or devices to different locations. These factors have been implicated in the levels of stress and fatigue experienced by workers. (10)

Tasks and processes

The nature and complexity of healthcare tasks has been identified as playing a key role in the ability of healthcare professionals to deliver safe and effective care across a range of care sectors. Task analysis looks at the range of cognitive resources and actions required in order to undertake a task effectively. Human factors science argues that a well designed product, service, process or system will be closely matched to the needs of the humans interacting with it. Such design will also take into account any human limitations including short term memory capacity, fatigue levels, how information is processed and the ways in which jobs and tasks are designed. Failure to account for human limitations often results in frustration, work delays, and taking shortcuts in order to get the work done. (11)

Patient characteristics

The human factors literature has identified a range of challenges that can arise when patients feel overwhelmed in relation to their care and treatment options. The skills/knowledge deficit might manifest as lack of computer expertise, prior use of technology which may then place patients in a position where they might use technology inappropriately due to lack of information, lack of instruction, or lack of appropriate training. Patients may also be unable to use technology as a result of impairment, due either to cognitive challenges or through diminished physical capacity. It is crucial to ensure that patients are not only provided with training, instruction and support, but attention needs to be paid to patients’ needs, beliefs, attitudes, expectations, mood and limitations, and willing they are to undertake self-care. (10)

Key points for nursing practice

- Clinical human factors provides a framework for identifying those things that impact on human performance
- Tools and interventions deployed in high risk environments are being applied in healthcare
- A range of non-technical skills, including teamwork and task management, are recognised as crucial to the delivery of safer patient care.

Full details of the search, analysis of the findings and full reference list can be found in the full report which can made available on request.