

‘Accidental’ design in participatory simulation

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THE WORK IN CONTEXT

Participatory simulation involves workers in simulations to identify ergonomic challenges and inform work system (re)design efforts. It leverages benefits of both participatory ergonomic programs and simulation in activity ergonomics, but has not been applied to care transitions, inherent to paediatric trauma care and key to safe, high quality care. As part of a larger project focused on improving transitions of paediatric trauma patients from the operating room to the paediatric intensive care unit, we used participatory simulations in our analysis phase before our design phase. Simulating the work of care transitions proved challenging, as the simulated setting did not have working phones, and the physical transition required leaving and re-entering the high-fidelity space. Written and verbal information about the patient was provided to participants before the scenario – the written document inadvertently became a tool for the participants and thus an artefact for future analysis. This work represents an example of incorporating participatory simulation in the analysis phase in addition to the simulation phase of a design project, enriching the work of participants and the study itself. It also discusses some the challenges of designing scenarios for participatory simulation. Choices we make, even to support participants, could lead to accidental design. Further, this work represents an important advance in the study of care transitions and could lead to implementing our accidental design following further evaluation.

KEYWORDS

Participatory simulation, care transition, work system (re)design

A brief outline of the work carried out

Participatory simulations enrich the work of designers, workers and decision makers while supporting work system (re)designs. Participatory simulations have not been used in the improvement of care transitions. Care transitions are the transfer of information, authority and responsibility for patient care from one clinician or group of clinicians to another, providing opportunities for resilience or error in patient care. Hospital-based care of paediatric trauma patients inherently includes many care transitions between hospital units. Trauma is the leading cause of death in children in the United States, so improvements in their care transitions represent a significant opportunity to improve outcomes.

As part of a larger project to improve paediatric trauma care transitions through work system redesign, we simulated transitions of a paediatric patient with a penetrating chest trauma from the operating room (OR) to the paediatric intensive care unit (PICU). The objective of this paper is to describe our simulation process, arguing for the use of simulations *earlier* in design projects during the analysis phase while discussing pragmatic considerations and “accidental” design in scenario development.

Findings/solutions (the outcome)

We conducted the simulations in the JUMP Simulation Center, a high-fidelity medical training facility. Each simulation consisted of a briefing, scenario and debriefing. The briefing provided participants information about the patient in the scenario. To aid participants, information about the patient was presented verbally and in writing. The scenario included preparation in the OR, physical transition, handoff in the PICU and planning for immediate future patient care. The debrief was a focus group organised around the Systems Engineering Initiative for Patient Safety (SEIPS) model. The simulation protocol is available at <https://hfss.ise.illinois.edu/research/using-simulation-to-evaluate-and-improve-team-cognition-in-handoffs/>.

Importantly, these simulations were of the *current* work situation. Trauma is unpredictable and care transitions are under time pressure, which complicate observation and preclude focus groups without delays and recall bias. Participatory simulations were selected to address those issues, but simulating transitions between care settings can be challenging. There was not a working phone line in the simulated OR or the simulated PICU, so the phone call prior to departure could not occur. The physical movement involved a route that left and re-entered the immersive simulated environment. The written information about the patient, provided to support diverse participants needing written information, was unexpectedly used by PICU participants to take notes during the handoff and support planning immediate future care.

Impact

Including participatory simulations in our analysis phase enriches our analysis and expedites the design phase. Our study also expands the use of participatory simulation to care transitions and highlights challenges in these types of simulations. We discuss the ways we addressed these challenges and highlight the impacts of our choices to support future work.

This study will also impact the broader area of care transition research, representing an innovative, interdisciplinary approach to improving care transitions. The research team is interdisciplinary and the participatory design process includes diverse stakeholders from different healthcare professions, while previous work focuses on one professional group at a time. Finally, the written information may be incorporated in our recommended redesign, depending on future work.