

## Summary

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**Background:** Robotic assistance systems are seen as a promising solution to improve nursing care and to relieve nursing staff. Despite intensive development efforts, these systems are still rarely used in everyday nursing practice. Current research mainly focuses on technological aspects and questions of acceptance, while the perspectives of patients and nursing staff, especially in clinical settings, have so far received little attention.

**Objective and research questions:** The aim of this study is to examine the development and integration of robotic assistance systems in clinical settings as a socio-technical negotiation process. From this aim, the following research questions are derived:

- a) Which problematizations guide the development of robotic assistance systems, and what applications result for acute care settings?
- b) How can the roles and relationships of the involved actors in the acute care setting be described within the framework of the obligatory passage point (OPP) during the development and integration of robotic assistance systems?
- c) How are roles, expectations, and value propositions negotiated between actors during intersement and which negotiation processes strengthen or weaken these connections?
- d) What requirements are placed on the development and integration of robotic assistance systems in clinical nursing settings?
- e) What are the consequences of using the robotic assistance system JEEVES<sup>®</sup> in acute care from the perspective of patients and nursing staff?

**Method:** A qualitative cross-sectional design was chosen to address the research questions. The methodological approach is based on Actor-Network

Theory (ANT) and was complemented by Grounded-Theory-methodology. Data were collected through episodic individual interviews and field notes in three hospitals within the framework of two projects aimed at developing and implementing robotic systems in clinical contexts. Interviews were conducted with nursing staff (n=27) and patients (n=33) and analysed in a cyclical process using open and axial coding.

Results: Patients and nursing staff are willing to take on their respective roles during development and integration and see robotic assistance systems as an opportunity to address staff shortages and relieve nurses. The findings show that human and robotic actors can establish connections. These connections are based on direct experience with the robotic system, emotional bonds between actors, perceived benefits in practice, and close support from project participants. During the pilot phase of JEEVES<sup>®</sup> in acute care, it became clear that such systems can take on the role of a supportive tool and relieve both nursing staff and patients. Successful implementation of sustainable robotic development requires a holistic view of user perspectives as well as technical and spatial requirements. The assumption that robotic systems for non-care tasks pose a threat to interpersonal relationships and interactions was not confirmed in this study.

Conclusion: The development and integration of robotic assistance systems requires close interdisciplinary collaboration between technology development, research, management, and practice. Actor-Network Theory (ANT) makes it possible to analyse technical artifacts as independent elements within networks of actors, while keeping the social dimension in view. It highlights the complex interactions and connections between technical systems and their human counterparts.