

Robots as Coworkers: Conceptualizing Healthcare Robots as Job Resources for Nurses

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Abstract

The increasing integration of automation and robotic technologies into healthcare has transformed nursing practice by supporting routine clinical activities and alleviating various workplace challenges. Existing evidence indicates that healthcare robots can reduce nurses' physical workload (Soriano et al., 2022), cognitive burden (Pollack et al., 2002; Cosar et al., 2020), occupational stress (Wada et al., 2003), and burnout while improving workflow efficiency and quality of care (Kachouie et al., 2014; Warmbein et al., 2025). Despite these documented benefits, healthcare robots continue to be conceptualized primarily as technological tools or patient-centred innovations, with limited theoretical attention devoted to their role in supporting nurses as employees. The purpose of this conceptual paper is to reconceptualize healthcare robots as job resources from the perspective of the Job Demands-Resources (JD-R) theory (Demerouti et al., 2001) and to develop a conceptual framework explaining how robots can function as effective workplace job resources for nurses. To achieve this, the paper integrates the JD-R theory with the Computers Are Social Actors (CASA) paradigm (Lombard & Xu, 2021) to explain how anthropomorphic characteristics influence nurses' perceptions of robots as coworkers. This paper proposes that healthcare robots can be viewed as potential job resources that help nurses manage their physical, cognitive and emotional job demands. It further argues that adding anthropomorphic and socially interactive features can strengthen their role by encouraging nurses to perceive them as supportive coworkers rather than merely technological tools. Furthermore, it argues that the effectiveness of robotic job resources depends on the dominant physical, cognitive, and emotional job demands experienced across different healthcare settings, thereby necessitating context-specific robot design. By introducing robots as an emerging category of job resources and advocating a nurse-centred approach to robotic design, this paper extends the JD-R literature, broadens the theoretical literature, broadens the theoretical understanding of human-robot collaboration, and provides practical guidance for healthcare organizations and robot developers seeking to design robotic systems that enhance employee wellbeing, reduce job demands, and improve organizational performance.

Keywords

Healthcare robots; job demands-resources (jd-r) theory; job resources; computers are social actors (casa); nursing management; anthropomorphism.