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I Become Your Extended Arms

How Distance and Technology Redefine Teamwork in Rural Distributed Emergency Teams

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Akademisk avhandling

som med vederbörligt tillstånd av Rektor vid Umeå universitet för avläggande av medicine doktorsexamen framläggs till offentligt försvar i Aula Biologica, Biologihuset, fredagen den 7 februari, kl. 09:00.

Avhandlingen kommer att försvaras på svenska.

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Title

'I become your extended arms' How Distance and Technology Redefine Teamwork in Rural Distributed Emergency Teams

Abstract

Background: Emergency care in rural areas often relies on *distributed teams*, where the physician participates remotely via videoconferencing. Limited research exists on how these teams perform compared with co-located teams, despite the importance of teamwork for patient safety.

Aim: This thesis explores teamwork and taskwork in distributed teams during emergencies in rural healthcare.

Methods: Study I mapped knowledge on teamwork in distributed settings through a literature review. **Studies II** and **III** employed a quantitative design, collecting data from video-recorded simulation-based team training sessions with students (**II**) and healthcare staff (**II, III**). Expert raters assessed team performance in these recordings (**II, III**). The reliability and validity of a team performance instrument were evaluated (**II**), and the instrument was subsequently used to compare the team performance of distributed and co-located teams (**III**). **Study IV** collected and qualitatively analysed focus group interviews to explore staff experiences, team dynamics and professional structures in distributed teamwork.

Results: Study I showed the importance of reliable technology, training, leadership and familiarity for effective distributed teamwork, while noting increased workloads and the need for clear communication. **Study II** confirmed the instrument's reliability and validity in the distributed setting for measuring team performance. **Study III** demonstrated that, overall, co-located teams performed better than distributed teams in emergencies. **Study IV** revealed that nurses found their expanded responsibilities stimulating yet challenging, physicians valued remote leadership but missed hands-on contact and nursing assistants noted improved patient connection.

Conclusion: This thesis concludes that distributed teams face unique challenges compared with co-located teams, such as increased workloads, and require targeted training.

Keywords: Rural area, cottage hospital, distributed teams, telemedicine, teamwork, scoping review, validity, cross-over, simulations, focus groups, discourse psychology.

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