

# 学位論文審査結果の要旨

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<p>(学位論文審査結果の要旨)</p> <p>Correlation Between the Social Network Structure and Well-Being of Health Care Workers in Intensive Care Units: Prospective Observational Study</p> <p>【主論文審査結果の要旨】</p> <p>著者らは論文において下記の内容を述べている。</p> <p><b>Background:</b> Effective communication strategies are becoming increasingly important in intensive care units (ICUs) where patients at high risk are treated. Distributed leadership promotes effective communication among health care professionals (HCPs). Moreover, beyond facilitating patient care, it may improve well-being among HCPs by fostering teamwork. However, the impact of distributed leadership on the communication structure and well-being of HCPs remains unclear.</p> <p><b>Objective:</b> We performed a social network analysis (SNA) to assess the characteristics of each HCP in the network, identify the number of HCP connections, analyze 4 centralities that can measure an HCP's importance, and evaluate the impact of distributed leadership structure on the well-being and communication structure of the medical staff.</p> <p><b>Methods:</b> Wearable sensors were used to obtain face-to-face interaction data from the ICU medical staff at Mie University Hospital, Japan. Participants wore a badge on the front of their clothing during working hours to measure the total frequency of face-to-face interactions. We collected data about the well-being of medical staff using the Center for Epidemiological Studies-Depression (CES-D) questionnaire and measured 4 centralities using SNA analysis. A CES-D</p>			

questionnaire was administered during the study to measure the well-being of the HCPs.

**Results:** Overall, 247 ICU workers participated in this clinical study for 4 weeks yearly in February 2016, 2017, and 2018. The distributed leadership structure was established within the ICU in 2017 and 2018. We compared these results with those of the traditional leadership structure used in 2016. Most face-to-face interactions in the ICU were among nurses or between nurses and other professionals. In 2016, overall, 10 nurses could perform leadership tasks, which significantly increased to 24 in 2017 ( $P=.046$ ) and 20 in 2018 ( $P=.046$ ). Considering the increased number of nurses who could perform leadership duties and the collaboration created within the organization, SNA in 2018 showed that the betweenness ( $P=.001$ ), degree ( $P<.001$ ), and closeness ( $P<.001$ ) centralities significantly increased compared with those in 2016. However, the eigenvector centrality significantly decreased in 2018 compared with that in 2016 ( $P=.01$ ). The CES-D scores in 2018 also significantly decreased compared with those in 2016 ( $P=.01$ ). The betweenness ( $r=0.269$ ;  $P=.02$ ), degree ( $r=0.262$ ;  $P=.03$ ), and eigenvector ( $r=0.261$ ;  $P=.03$ ) centralities and CES-D scores were positively correlated in 2016, whereas the closeness centrality and CES-D scores were negatively correlated ( $r=-0.318$ ;  $P=.01$ ). In 2018, the degree ( $r=-0.280$ ;  $P=.01$ ) and eigenvector ( $r=-0.284$ ;  $P=.01$ ) centralities were negatively correlated with CES-D scores.

**Conclusions:** Face-to-face interactions of HCPs in the ICU were measured using wearable sensors, and nurses were found to be centrally located. However, the introduction of distributed leadership created collaboration and informal leadership in the organization, altering the social network structure of HCPs and increasing organizational well-being.

本研究では医療コミュニケーション分野における課題となっていた、コミュニケーションの全面的及び包括的なデータ収集をウェアラブルセンサーによって可能にした。さらにその結果をソーシャルネットワーク解析することで客観的に評価して、医療分野における課題である集中治療室における医療従事者の幸福度の改善に迫った革新的論文であり、学術上極めて有益であり、学位論文として価値あるものと認めた。

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