EVALUATING THE IMPACT OF SAFETY CULTURE DIMENSIONS ON PATIENT SAFETY USING MACHINE LEARNING

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ABSTRACT

There is a growing recognition that safety culture has a huge impact on continuous improvement of patient safety and quality. As a multidimensional concept, safety culture is mainly measured through surveys in healthcare settings. The most common survey is the Hospital Survey on Patient Safety Culture (HSOPSC), created by the Agency for Healthcare Research and Quality (AHRQ), used in more than sixty countries so far. While the HSOPSC has been used satisfactorily in various healthcare settings worldwide, there has been no clear picture regarding what safety culture dimensions drive overall patient safety. To shed light on this, we used aggregate survey data from various hospitals in the US in multiple years to analyse the relationship between various safety culture dimensions and patient safety. As a machine learning tool, random forest model was used to build multiple decision trees and integrate them to get accurate and stable prediction on the relationship between aggregate safety culture dimensions and patient safety. It can be concluded that random forest model generated valuable results which may be used by hospitals to identify most significant categories that drive patient safety grade in their particular healthcare settings.

Keywords: healthcare operations, patient safety, safety culture, random forest modelling, machine learning