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Construction of a hospitalized pressure ulcer assessment model using classification technologies

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The incidence of pressure ulcer is one of the essential indicators of clinical care. Even many scholars and experts have aimed to prevent the adverse event of pressure ulcer, but the high incidence of hospitalized pressure ulcer was unfortunately commonly found in clinical practices. Therefore, identifying the risk factors and implement preventive interventions of pressure ulcer to avoid wound, pain, surgical treatment, prolonged hospitalization, infection, mortality and health expenditure increasing become more critical. We found that the Braden scale, Norton scale, Gosnell scale and Waterlow scale were broadly used for risk evaluation of pressure ulcer. However, these scales were established by the criteria of various patients and applicability or usability of the caring system. In this study, we use three classifiers of data exploration technology includes decision tree, logistic regression, and random forest to create the prediction model for hospitalized patients with a pressure ulcer. A total of 11838 medical records of hospitalization were collected and analyzed in 30 sets of training samples, and following with a 10-fold cross-validation was conducted to verify the performance of these prediction models. The results revealed that the sensitivity of the decision tree, logistic regression, and random forest were 79.94%, 75.81% and 84.48%, respectively. It demonstrated that the random forest has better classification efficiency of constructing a predictive model. We also found that the predictive factors for impaired skin integrity, systolic pressure, poor expression. Basel scale and micro vascular filling time greater than 2 seconds are the most influential risk factors for pressure ulcers. This study provides the critical risk factors to caregivers for patient physical assessment to predict pressure ulcer incidence of hospitalized patients and to implement preventive actions in clinical practice. Overall, these findings enhance the improvement of the medical care quality and service.

Biography

Kang Meng Feng has graduated from Institute of Information Management in Chung Cheng University, Chiayi, Taiwan in 2017 and received Bachelor of Science degree in Nursing from Chang Gung University of Science and Technology, Chiayi, Taiwan in 2008. Kang Meng Feng is currently working at St. Martin De Porres Hospital as a Chief Nursing Officer in Surgical Intensive Care Unit engaged in clinical management and teaching.

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