UNIVERSITY of MARYLAND
SCHOOL OF NURSING

Practice Poster Award

Leveraging Data Analytics to Investigate the Relationship Between Patient Demographic and Falls in Home Care

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Problem Statement: An emergency room (ER) visit due to a fall is the most frequently encountered potentially avoidable event (PAE) during home care episodes. Preparing a safe home environment for patients is a prerequisite for home care to fulfill its promises. As the elderly population increases in number and diversity, understanding the patient demographics associated with falls can facilitate targeted interventions for reducing fall risks during home care episodes. Data analytics provides an opportunity to address such focused quality improvement needs. **Methods:** This study involved a secondary analysis of data primarily collected between 2010 and 2014 from a Medicare-certified not-for-profit home health agency (HHA) in the mid-Atlantic region of the US. The data included: (i) Basic patient characteristics, age, gender, ethnicity, and zipcode, from the electronic health records of the HHA; (ii) Falls data from a PAE reporting system; (iii) Median Household Income data from the Populations Studies Center at the University of Michigan; and, (iv) Rural-Urban Commuting Area (RUCA) codes from the University of Washington. Basic patient characteristics and falls data were merged using the episode IDs and resulted in almost thirty thousand observations. Median income and RUCA were used as proxy measures for socio-economic status and rurality, respectively, and were merged with the episode-level data via zipcode. Using the R statistical environment, the statistical analysis involved descriptive analysis followed by the development of binary logistic regression models. The basic patient characteristics, RUCA, and Median Income formed the patient demographics which were used as the predictors in modeling; an ER visit due to a fall during a home care episode was a binary outcome used as the response variable. **Results:** The descriptive analysis revealed that there were 11,482 males and 18,252 females; the average age was 70. Caucasians formed the majority (57%) followed by African-Americans (39%), Asians (7%) and Hispanics and Latinos (6%). The statistical models showed that age, RUCA, and ethnicity (Caucasian) were significant at p=.01. The likelihood of ER visits due to falls quadratically increased by age (i.e., at a faster rate). Patients living in the suburban settings visited ERs for falls more significantly. Caucasians did so significantly more compared to African-Americans. Gender and median income were not significant. **Significance:** Leveraging data analytics provides useful and interesting local insights to HHAs: For example, by controlling for age and urbanness, it was observed that Caucasians visit ERs for falls at a significantly higher rate. This study demonstrates that data analytics, with effective use of relevant data from disparate sources, presents an opportunity to HHAs for tailoring care towards their specific patients' demographic profiles and improving the care quality and patient safety outcomes. As the home care industry starts to make a transition from a volume-based to value-based reimbursement model, the use of data analytics opens new avenues for HHAs to provide care from a proactive standpoint. Knowledge mined from episode-level data gives HHAs improved decision making capabilities and strategic advantage which can improve their capacity to both remain a viable business and provide quality care successfully.