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A Comparison of Voice Recognition System and Traditional Keyboard Charting for Nurse Documentation

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Purpose:

As an essential part of nursing practice, documentation accounts for more than one-third of nurses' time. Decreasing documentation burden is the first recommendation of the American Medical Informatics Association (AMIA) report on the electronic health record 2020 Task Force. With recent voice recognition (VR) technology advances, healthcare settings and professionals have increasingly adopted VR systems for documentation. Despite the widespread use, a recent systemic review of VR for clinical documentation from 1990 to 2018 concluded that research on this topic mainly involved the radiology department and emergency medicine, and there was a lack of studies in nursing. More research on VR for nurse documentation is particularly important, since nurses are one of the largest users of health information technology and suffer from a high documentation burden.

The purposes of this study are threefold to: 1) compare the document times between a VR program and traditional keyboard charting 2) compare the number of errors between the two methods, and 3) investigate users' experiences with VR and identify factors influencing documentation time.

Methods:

A pilot study was conducted using a simulation experiment VR program (Dragon Medical 360) verses traditional keyboard charting (Cerner) for 15 acute care nurses. A crossover method with repeated measures was utilized. Each nurse was given two simple assessment scenarios and two complex assessment scenarios to document using both VR program and keyboard charting. The sequence of the four scenarios was assigned in a random order. Paired sample t-tests and multivariate linear regression models were used for data analyses. In sensitivity analyses, non-parametric Wilcoxon signed-rank tests and Fisher's exact tests were used to check the robustness of our results.

Results:

The VR program saved the nurses 2.3 minutes (simple scenario) and 6.1 minute (complex scenario) on average and the differences were statistically significant ($p < 0.001$). No significant differences in errors between the two programs, regardless of simple or complex assessment scenarios were noted. Moreover, nurses 40-59 years old used more time to document simple scenarios than those 20-39 years old ($\beta = 0.88$, $p = 0.071$). Compared to full-time or part-time nurses, those who worked as PRN used

more time to document complex scenarios ($\beta=1.14$ $p=0.046$). Eighty percent reported a preference of using VR program for documentation, while 20% preferred using the keyboard for documentation. Overall, 87% agreed the VR program helped speed up charting.

Conclusion:

Using a simulation study, this study makes several important contributions to the small body of knowledge regarding VR program for nurse documentation. First, compared with traditional charting method, VR program saved nurses time for documentation. Second, there was no significant difference in accuracy between the two methods. Third, age and shift work were related to documentation time of using VR program. Fourth, the majority of nurses preferred to use VR program for nurse documentation. Although the sample size was relatively small, these findings lay the groundwork for more research on VR-assisted nurse documentation. Our findings indicate that VR technology has emerged as an effective strategy to potentially reduce nurses' documentation burden, while persevering documentation quality.

Title:

A Comparison of Voice Recognition System and Traditional Keyboard Charting for Nurse Documentation

Keywords:

Nurse Documentation, Traditional Keyboard Charting and Voice Recognition

Abstract Summary:

This study shows how a voice recognition technology can improve documentation times compared to traditional charting methods and can allow nurses more time to focus on patients. Patients can benefit from receiving more care and hospitals can benefit from decreasing incidental overtime.

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