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## Conference Abstract

### **Nurse utilization of patient monitoring systems at an Emergency Department bedside ward – A survey analysis**

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## Abstract

**Introduction:** Patient monitoring in Emergency Departments (ED) is a difficult task due to the unpredictability in workload, patient severity, and derivation of correct treatment plans. In this setting, nurses present the first line of observation and play an important role in gathering and interpreting the state and trajectory of patients. Alongside clinical intuition and experience, monitoring of vital signs is one of the most important tools for keeping track of patients. In this study, we present a subset of results from a survey conducted at an ED with the objective of assessing the importance of several aspects of patient monitoring, focusing on the perceived importance of two monitoring modalities.

**Methodology:** The objective of the survey was to establish how important nurses deemed a predefined set of variables relating to three aspects of patient monitoring; 1) monitoring in general as a tool, 2) the utility of bed-side monitoring, and 3) the utility of monitoring dashboards in shared office spaces. The survey consisted of three parts; first a set of quantitative questions concerning age, gender, work place, department experience, and total clinical experience. Secondly, eleven multiple choice questions relating directly to the survey objectives, and lastly four interval scaled questions to serve as measurements of validity and a single open-ended field for additional comments.

**Results:** Of the 61 department nurses, we acquired 33 responses (54% response rate). Four incomplete responses with missing information on experience were removed before analysis. The mean experience was 91.6 months, SD=114.7, 95% CI 43.6. Mean ED ward experience was 18.5 months, SD=10 months, 95% CI 3.8. Calculating the ratio between ED and total clinical experience yielded a mean of 0.56 (SD = 0.42, 95% CI 0.16). Almost 50% of respondents were below 30 years of age. We analyzed the relationships between experience, total clinical and department specific, and perceived utility of either bedside monitors or office overview monitors. One way analysis of variance for these four combinations found significant linear relationships between; total clinical experience and perceived utility of monitoring dashboards, utility =  $-0.007 \times \text{TotalExperience}_{\text{months}} + 8.44$ , [F(1,27)=4.88,  $p < 0.05$ ,  $R^2 = 0.15$ ], and for department experience and perceived utility of bed side monitors, utility =  $-0.08 \times \text{EDEXperience}_{\text{months}} + 9.84$ , [F(1,27)=4.58,  $p < 0.05$ ,  $R^2 = 0.14$ ].

**Discussion:** Utility of bedside monitors is higher initially, but also declines much more rapidly. It is interesting to observe that there is a negative correlation between experience and utility for all combinations. This is likely due to the notion of clinical independence from monitoring equipment as experience and heightened clinical intuition supersedes reliance on tools. Although, neither of the regression models have very high  $R^2$  values, the notion of decreased utility as a function of experience should spur considerations on how to design health informatics systems that manage to support, and add value to, clinical workflows regardless of experience. One approach could be to establish a sense of ownership through individual customization. Decreased utilization has possibly even larger impact in telemedicine environments where clinicians and citizens tend to operate the platform in solitude.

## **Keywords**

**clinical utility; patient monitoring; health information systems**