Physicians’ satisfaction with computerised physician order entry (CPOE) at the National Guard Health Affairs: A preliminary study

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HIC 2012  2 August 2012
Computerised Physician Order Entry (CPOE) System

- A clinical application that allows health care providers to electronically enter orders (Labs, medication, imaging etc.) for patient care
Advantages of CPOE

- Order entry at the point of care
- Improved clinician workflow
- Reduced errors related to illegible writing or verbal communication
- Inventory management support
- Automatic billing
- Improving patient care by supporting physicians in clinical decision making
National Guard Health Affairs (NGHA)

- Is a leading medical complex in the Kingdom of Saudi Arabia (KSA)
- Consists of medical cities scattered across KSA
- All hospitals within NGHA are JCI accredited
- Provide state of the art health services to other countries within the Middle East
CPOE in Saudi Arabia

- Intended complete rollout of CPOE in the Central, Western and Eastern Regions of SA in 2009
- A pilot project in a department of the Central region was confronted by multiple barriers including physician resistance, lack of internal expertise in health IT, small IT team sizes and major expansion of the hospital at the time.
- CPOE implemented at only one of the National Guard Health Affairs (NGHA) Medical cities in September 2009 in the Eastern Region of Saudi Arabia
CPOE in Saudi Arabia (cont..)

- Expected that CPOE will be implemented across all NGHA hospitals and departments by 2012.
- To date, no study has evaluated CPOE in the Eastern Region post-implementation.
- This study measures overall physician satisfaction with CPOE and investigates the features associated with satisfaction by measuring physicians’ perceptions on CPOE characteristics such as clinicians’ workflow, efficiency, usability and patient safety.
Methods

- **Study setting**
  - 112 bed NGHA hospital in the Eastern Region of SA
  - Hospital offers range of inpatient and outpatient services – 7000 patients seen monthly
  - CPOE system implemented in all units of the hospital
  - CPOE is an integrated feature of the existing computerised patient record (CPR) and not a “stand alone” clinical information system

- **Study participants**
  - All physicians working and using CPOE in the hospital
  - 101 physicians at the time of study
  - Convenience sampling used
Methods

• Study Design and Instrument
  • Cross-sectional exploratory study
  • A questionnaire was developed and consisted of 3 domains (demographic data, CPOE user characteristics and physician opinions on specific features of CPOE)
  • Questionnaire was piloted and face and content validity were measured by an expert panel of health professionals, physicians and HI professionals

• Research approval
  • Granted by the KSAU-HS scientific research committee and the NGHA hospital in April 2010

• Data analysis
  • Descriptive statistics, Mann-Whitney U, Kruskall Wallis and correlational analyses using SPSS
Results

• In total, 81 physicians were included in the analysis - 80% response rate
• The majority of the physicians were male staff physicians between the ages of 30 - 39 years and the most common physician specialities were surgery, emergency, internal medicine and obstetrics/gynaecology.
• Almost all of the physicians had undertaken CPOE training, were regular computer users and had good to very good data entry skills.
Physicians Perceptions on CPOE characteristics

- Order entry reduces patient care errors
- The order entry system is easy to use
- System response time on CPOE is fast
- Technical support is always available
- Laboratory data retrieval is fast
- Radiology data retrieval is fast
- Correcting mistakes is easy
- Help messages are clear
- Referencing materials are clear
- Error messages are helpful
- Sequence of screens is clear
- Text and graphics are clear
- Locating items on the system is easy
- Overall, I am satisfied with CPOE

Agree %  Neutral %  Disagree %
## Correlation of physicians’ satisfaction with CPOE characteristics

<table>
<thead>
<tr>
<th>CPOE characteristic</th>
<th>Correlation with Satisfaction (r)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order entry reduces patient care errors.</td>
<td>0.402*</td>
</tr>
<tr>
<td>The order entry system is easy to use.</td>
<td>0.520*</td>
</tr>
<tr>
<td>System response time on CPOE is fast</td>
<td>0.348*</td>
</tr>
<tr>
<td>Technical support is always available</td>
<td>0.299#</td>
</tr>
<tr>
<td>Laboratory data retrieval is fast</td>
<td>0.422*</td>
</tr>
<tr>
<td>Radiology data retrieval is fast</td>
<td>0.035*</td>
</tr>
<tr>
<td>Correcting mistakes is easy</td>
<td>0.518*</td>
</tr>
<tr>
<td>Help messages are clear</td>
<td>0.450*</td>
</tr>
<tr>
<td>Referencing materials are clear</td>
<td>0.381*</td>
</tr>
<tr>
<td>Error messages are helpful</td>
<td>0.354*</td>
</tr>
<tr>
<td>Sequence of screens is clear</td>
<td>0.585*</td>
</tr>
<tr>
<td>The meaning of text and graphics are clear</td>
<td>0.451*</td>
</tr>
<tr>
<td>Locating items on the system is easy</td>
<td>0.650*</td>
</tr>
</tbody>
</table>

*p≤ 0.001  #p≤0.05
Discussion

- Physicians age, area of speciality and nationality were significantly related to physicians’ satisfaction with the system.
- Training sessions, use of computer and data entry skills did not impact on overall physicians satisfaction with CPOE.
- Physicians were positive about CPOE’s ease of use and ability to reduce patient care errors.
- Physicians were less positive about technical issues such as slow laboratory and radiology data retrieval.
- These technical issues should be seen as areas for improvement.
Limitations

- Cross-sectional design of the study
- Sampling technique
- Timing of study shortly after implementation of CPOE
- Single item questionnaire
Conclusion

- Physicians are satisfied with the new CPOE system at a hospital of the NGHA – Eastern Region.
- CPOE characteristics were strongly correlated to physician satisfaction in particular, efficiency and quality of care.
- Further studies are needed to assess whether user satisfaction results of this study are similar to other NGHA sites.