



Original Article

Attitudes and Knowledge of Hormozgan University of Medical Sciences Nurses Regarding the Implementation of Computerized Physician Order Entry

Narjes Mirabootalebi¹, Hamidreza Mahboobi^{2,3}

1. Instructor Department of Health Information Technology, Hormozgan University of Medical Sciences, Bandar abbas, Iran.
2. Research Center for behavioural and neurosciences , Hormozgan University of Medical Sciences, Bandar abbas, Iran.
3. Payame Noor University (PNU), Tehran, Iran.

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Corresponding author: Narjes Mirabootalebi, Instructor Department of Health Information Technology, Hormozgan University of Medical Sciences, Bandar Abbass, Iran. Tel: +98-9173586177, Email: elham761@gmail.com

ABSTRACT

Introduction: Despite potential benefits of CPOE (Computerized Physician Order Entry) systems, recent studies have cast some doubts on their role in reducing errors. CPOE systems with poorly designed interfaces have proven to cause dissatisfaction and introduce new kinds of errors in the ordering process. The main objective of this study is to identify problems related to a CPOE medication system's design and determining their severities.

Methods: This cross sectional study investigated the views of nurses of Hormozgan Medical Science University regarding implementation of Computerized Physician Order Entry system. Data was collected using a researcher made questionnaire. The questionnaire content validity and reliability was previously approved. Data was analyzed by SPSS 20 software using frequency distribution, percentage and test mining.

Results: Among the participants, 95.5% agreed to use a medical document system, 87.8% declared that it saved staff's time. About 97.7% considered it as a help to achieve a high level of patient safety and 90% thought that it would increase the reliability of data. About 86.8% were concerned about the privacy issues of CPOE and 334 (83.4%) people thought that this system lacks the support of medical staff.



Conclusion: CPOE increases the quality and safety of healthcare. Using CPOE systems improves the security and quality of health care and reduces errors. Therefore, according to present conditions, implementation of this system must be taken under consideration.

Keywords: Computerized Physician Order Entry System, Medication Errors, Medication Systems.

Introduction:

Medication errors potentially harm people and are the reason of many complaints and claims. One of the most important medication errors is predictable preference reaction that causes to harm people (1). Medication errors are common in hospitals (2-5). Most of these medication errors are small or even predictable. The smallest drug mismatch causes side effects. Recent reports showed that one out of 100 errors is related to drug side effects. Perhaps this effect is not that much of a problem, it is not acceptable for people out of organization (5). The most common solution of this problem is computerized provider order entry (CPOE) systems. CPOE systems have potential to enhance patient safety by reducing the errors of medications orders (6–9). CPOE is an electronic system that records physician's orders. Nowadays this system has replaced paper handwritings and will help to upgrade the health rate of healthcare organizations (10).

This system warns drug cross reactions and drug-sensitivity reactions. Finally, this system suggests drugs with appropriate dosage and generally decreases medication errors (11). CPOE systems can be remarkably effective in reducing the rate of serious medication errors.

David Bates showed in his study that CPOE reduced error rates by 55% — from 10.7 to 4.9 per 1000 patient days. Rates of serious medication errors fell by 88% in a subsequent study by the same group (7). The prevention of errors was attributed to the CPOE system's structured orders and medication checks (14). A study conducted by David Classen showed a 70% reduce in antibiotic drug side effects after implementing CPOE (16). The implementation of CPOE was a significant and positive step toward improving patient care in a large majority of the hospitals surveyed.

The purpose of this study was to specify the advantages and barriers of CPOE system in hospitals of Hormozgan University of Medical Sciences and provide results for relative departments in Ministry of Health and Care in order to implementation, utilize and amend them.

Methods:

This cross sectional study was conducted in hospitals of Bandar Abbass city (Shahid Mohammadi, Pediatrics Hospital, Shariati and Ebn-e Sina). Data was collected using a researcher made questionnaire that used information from library studies and a Computerized Physician Order Entry system. The validity and reliability of the questionnaire was approved. The questionnaire is composed of two parts, first part is related to demographic information including: age, sex, field of study, education degree, work experience and second part is related to research questions that are classified base of goals



including: Efficiency the CPOE System (16 questions), outcome of the CPOE use (11 questions), Barriers of CPOE (7 questions) benefits of CPOE (6 questions). Its validity was measured by specialists and experts' opinions in this regards and Test Retest was used to measure its reliability (78%).

Data was analyzed in SPSS 20 software using frequency distribution, percentage and test mining was used to investigate relations between variables.

Results:

All questionnaires were distributed to all users of hospital information system. Out of all questionnaires 400 (87.3%) were returned. Among the participants, 363 (90.7%) were female and 37 (9.3%) were male and 232 people (58%) were between 26 to 40 years old. There were 335 (83.7%) nurses and 36 (16.3%) midwives. Among them, 240 (59.9%) had 1 to 5 years of work experience. Only one of the participants had previously experienced a CPOE system and received training for CPOE system. Table 1 and 2 show the responses of the participants.

Table 1: The opinion of participants regarding CPOE benefits

The CPOE system provides adequate support for :	<i>Agree</i> <i>(number)</i>	<i>Agree</i> <i>(Percentage)</i>
Oral medication	296	74 %
Injections	272	68 %
Infusions	198	49.5 %
Inhalations	343	85.7 %
Medication in connection with home visits	369	92.25 %
Changes medication regimes	294	73.5 %



Provides access to a public listing of medication	189	47.25 %
Provides a structured overview of current and previous dosages and prescriptions for the patient	254	63.5%
Provides clinically relevant alerts for drug interactions	284	71%
Is easy to use in routine work	265	66.2%
Is easier to manage than paper records	246	61.5%
Is faster to handle for prescriptions than the paper records	203	50.7%
Reduces the risk of prescription errors	368	92%
Has a better approach for prescriptions	359	89.7%
Provides an opportunity for effective communication with other staff in the treatment of the patients	219	54.7%
Saves time	382	95.5%



Table 2: Outcomes of the CPOE system use

Outcome of the CPOE system use	Frequency of agree	Percentage of agree
Helps to achieve a high level of patient safety	391	97.7%
Makes it possible to correct errors in prescriptions	295	73.7%
Increases the reliability of data	360	90%
Increases the legibility of data	349	87.25%
Contributes to information exchange between different caregiver	268	67%
Increases the un-safety in the pharmacotherapy	35	8.7%
Contributes to/requires double documentation (both on paper and in the CPOE)	102	25.5%
Causes doubts about reliability/completeness of data	56	14%
Leads to computer –related problems (soft ware and hardware) which impact on time	89	22.2%
Increases computer dependency	65	16.2%
Leads to more adverse drug events	2	0.5%



Conclusion:

In our study, 382 people (95.5%) considered CPOE as a time saver for staff and 369 people (92.2%). Bate and colleagues showed in their study that a short time is necessary to complete drug, laboratory, radiology orders and lucent of orders is completely clear after implementing CPOE (16). Nurses need a computer beside patient's bed to record critical symptoms and initial evaluation and many researchers have shown that using a computer beside a patient is useful to record numerical data (17).

Also 391 people (97.7%) considered CPOE as a help to achieve a high level of patient safety and 360 people (90%) declared that it increases the reliability of data. Willa and colleagues indicated that nurses support CPOE to increase the quality and safety of healthcare. CPOE affects the educational needs of nurses and physicians regarding their relationship with patients. Nurses also need to learn strategies to minimize its effects on their work and workflow (18). The decision to implement a CPOE system is not simply a matter of deciding that it is a good idea for improving quality of care and patient safety.

In this study, 347 (86.8%) people were concerned about the privacy issues and 334 (83.4%) thought that this system lacks support of medical staff. Sultan Alanazy and colleagues recognized ten barriers as being of hindrance to the implementation of EHR systems. These are high costs of adaptation, instability of vendors, patient confidentiality and privacy, lack of experience with the use of computers, lack of quality and high complexity of EHR systems, security in the access and use of EHR systems, lack of uniform standards, and system maintenance and downtime (19).

Among all the participants, 382 people (86.8%) stated that CPOE increases revenue and 369 people (83.4%) considered it as a cost reduction system.

Some effects of applying successful COPE are as bellow (20-22):

1. Improving security and health of patients
2. Reducing medication errors
3. Exiting alarms in case of occurrence medication interference reactions and drug allergy
4. Supporting the clinical decision making
5. Increasing confidence to recorded data

Organizations should consider this important point that despite implementing CPOE cannot completely reduce medication errors, it decreases up to 85% them. Therefore spending costs for implementing CPOE is cost effective for an organization.

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