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Implementation of an Outsourced Transnational Service of Clinical Decision Support System

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Abstract

The aim of this study is to describe the implementation and evaluation of an outsourced Clinical Decision Support Systems (CDSS) service of drug-drug interaction (DDI) alerts in an Uruguayan outpatient healthcare network. A crosssectional study was developed. 1.5 alerts were triggered of every 1000 prescriptions. Clinicians accepted 44 % of the total alerts. In conclusion, the implementation of CDSS was achievable.

Keywords:

Decision support systems, Clinical; Drug Interactions; Outsourced Services

Introduction

DDI are causes of preventable adverse drug events (ADEs). DDI type D can produce mayor ADEs and type X may be mortal. DDI are related to 2%-3% of the hospital admissions [1]. CDSS can reduce ADEs caused by DDI, by alerting the physician about them [2]. Universal Soluciones Tecnológicas (UST) is a company that provides IT to an Uruguayan private healthcare network with 300 thousand consumers. Systematization of medical terminology has been introduced in the Electronic Medical Records (EMR), consuming Hospital Italiano de Buenos Aires (HIBA) terminology web services. The purpose of this study was to implement and to evaluate an outsourced CDSS service of DDI alert in an outpatient healthcare network.

Methods

A cross-sectional study was carried out taking 5 months before and 5 months after the implementation of the IDD alerts, in the health network of UST in Uruguay. The EMR was audited in case of overriden DDI alerts to evaluate user's override's motives. The prevalence of DDI was compared before and after CDSS implementation. Data analysis was done with EPIDAT version 3.1 with 95% confidence level.

Results

CDSS services including DDI alerts of type D and X was developed by HIBA and uploaded to a web service. UST started consuming from a development environment and following HIBA design guides, for the graphic alert's interface. Two months later with the satisfactory tests, the CDSS services went live. EMR users (physicians) received capacitation through the application itself. During the 5 months after CDSS implementation 1.5 DDI alerts were triggered every 1000 prescription. Physicians cancelled 44% of prescriptions with DDI alert and override 54%. Override justifications were: 42% "other" explained by free text, 32,5% "limited time", 13% "benefits/risks", 7% "tolerance" and 5,5% "no alternatives available". Compared to prescriptions performed before the CDSS implementation, DDI after CDSS alerts implementation were approximately 80 % lower (RR: 0.21; CI_{95%}: 0.18-0.26; P<0.0001). The prevalence of patients with DDI over the total of patients with any drug prescription was 0.50% before CDSS alerts compared to 0.30 % with CDSS alerts (RR: 0.68; CI_{95%}: 0.57-0.82; P<0.0001).

Discussion

The outsourced CDSS service was effectively and efficiently implemented. The overridden alerts were mainly attributable to a gap between knowledge and practice. Further investigations are necessary to improve the acceptance. A decrease in the DDI prevalence was associated to the implementation of CDSS alerts. However, analytical studies need to be conducted to investigate the potential causality. CDSS showed to be a tool for learning and updating knowledge for a variety of users across national and institutional boundaries. Users trained virtually had heterogeneous knowledge and capabilities and resulted in a minor limitation in the implementation.

Conclusion

The implementation of the outsourced CDSS was feasible, without major technical or professional difficulties.

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