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A nationwide computerized patient medication history: Evaluation of the Austrian pilot project "e-Medikation"

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ARTICLE INFO

ABSTRACT

Purpose: To manage medication treatment and to assure medication safety, health care professionals need a complete overview of all drugs that have been prescribed or are taken by a patient. In 2009, Austria launched the pilot project "e-Medikation" in three pilot regions. E-Medikation gives access to a patient's nationwide medication list and includes medication safety checks. The objective of this paper is to report on the evaluation results and lessons learnt.

Methods: A formative evaluation study performed between July and December 2011 comprised a standardized survey of participating physicians, pharmacists, and patients, as well as an analysis of the e-Medikation log files.

Results: During the evaluation period, 18,310 prescriptions and 13,797 dispensings were documented, and 22,359 medication safety checks were performed. Overall, 61 physicians, 68 pharmacists, and 553 patients responded to a written survey. The results showed high acceptance of the idea of e-Medikation among pharmacists and patients and mixed acceptance among physicians. The satisfaction with the quality of the software used in the pilot project was low.

Conclusions: The overall aim to increase medication safety seems achievable through e-Medikation, but several limitations of the pilot project need to be solved before a national rollout. Based on the evaluation results and after redesign of e-Medikation, Austria is now planning a nationwide introduction of e-Medikation starting in 2015.

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1. Background and objectives

A comprehensive medication overview is essential for health care professionals to manage medication treatment and to assure medication safety when prescribing or changing drugs.

Traditionally, to obtain the complete medication history at the first encounter, the physician asks the patient about the current medication. Any new orders are balanced with this information. This medication reconciliation process is designed to prevent medication errors at patient transition points [1] and is seen as an important precondition for medication safety [2–7]. Medication reconciliation includes creating the most complete and accurate list possible (the so-called best possible medication history) of all medications the patient is currently taking. It is essential to compare this list against any new medication orders that are issued in the course of admission, transfer, and/or discharge; to identify any discrepancies and bring them to the attention of the prescribing health professional; and, if appropriate, to make changes to the orders while ensuring that changes are documented. Updating the list as new orders are written, communicating the list to the next care provider whenever the patient is transferred or discharged, and providing the list to the patient at the time of discharge contributes to patient safety [8]. Several studies reported decreases in medication error rates after successfully implementing medication reconciliation programmes [9–11].

However, medication information obtained directly from a patient during a first patient–physician encounter has been found to be error-prone [12–15], especially in the case of elderly patients and patients affected by polypharmacy [16,17]. To improve this situation, applications have been developed to support patients in managing their own medication list online, and to make them available to their health care providers [18]. However, these patient-managed medication lists also bear the risk of being incomplete.

"Assuring Medication Accuracy at Transitions in Care" and "Communication During Patient Hand-Overs" are two of the nine WHO patient safety solutions [8]. Clearly, the accuracy of the medication history may be improved when health care providers use an electronic medical record (EMR) [16] that provides access to information on recent prescriptions. However, these medication lists may be fragmented between different EMR systems. Germany has developed a machine-readable, paper-based medication plan to allow the exchange of a medication history between institutional EMRs [19] – however, communication of this information between institutions is not guaranteed, as the paper work must be handed over by the patient. Also, medication plans derived from EMRs often show large discrepancies to the real medication taken by the patients [20,21], for example in cases where the patient receives prescriptions from different health care providers, where the patient takes over-the-counter drugs (OTC), or where a prescribed medication is no longer taken [22].

Besides using prescription information, the medication history can also be based on dispensing information available from pharmacies. This information is, however, also typically fragmented between numerous pharmacy systems. Due to technical and organizational challenges of data integration, medication lists solely built on information from pharmacy systems are commonly incomplete [23,24]. In some countries such as the Scandinavian countries and the Netherlands [25–28], e-Prescription is being introduced. Here, an electronic prescription that is communicated automatically from the health care provider to a pharmacy replaces the paper-based prescription. Both prescription and dispensing information are usually made available through a national e-Prescription database that either contains the prescription information itself or an index to this information. This information can be used to complement the medication history [17,23]. Turkey also has a national medication list that is used at the moment, albeit only for an inventory check in the pharmacies [29]. In other countries, such as Denmark and Ireland, reimbursement databases contain all information on dispensed and reimbursed medication [30,31]. However, the automatic integration of OTC drugs purchased directly at a pharmacy remains in all cases problematic, as no prescription for them is available [23]. In addition, the existence of a prescription or dispensing does not always mean that the medication is truly taken. Finally, even those countries with a national prescription database notice discrepancies between the medication currently taken, as stated by the patient, the medication lists in the providers' EMRs, and the information within a national prescription database [17,32].

Overall, while several sources for prescription and dispensing information regarding a patient are available, the integration of this information into a complete medication history remains a technical and organizational challenge. Thus, an easily accessible and complete medication list is not available in many countries. This is also true for Austria, where prescriptions are still issued in paper-based form and where no regional or national prescription or dispensing database, covering both inpatient and outpatient medications, has been available until now.

In 2009, Austria launched the pilot project "e-Medikation" that aimed at providing access to a complete national medication history and that includes medication safety checks. Following the vision of the U.S. National Library of Medicine, the objective was to "bring the medications an individual is currently taking to the doctor's attention at the time important decisions about new prescriptions are being made" [33]. To better understand the potential impact and feasibility of e-Medikation, and to support the decision about a national rollout, an evaluation study was conducted.

The objective of this paper is to report on the results and lessons learnt from the evaluation of the e-Medikation pilot project in three pilot regions in Austria. The focus of this evaluation was threefold: user satisfaction; potential impact of e-Medikation on patient safety, as seen from the point of view of the participating groups; and technical feasibility of e-Medikation.

2. Methods

2.1. The Austrian e-Medikation system

The e-Medikation pilot project was a public national service launched in March 2009. E-Medikation managed the