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E-prescribing: The doctors' and pharmacists' perceptions in the Greek prefecture of Corinthia

V. Brinia[1], M. Daniil[2]

[1] Dpt. of Management Science & Technology, Athens University of Economics and Business, Greece

[2] University of Peloponnese, Corinthos, Greece

*Corresponding Author

V. Brinia

Email: vbrinia@aueb.gr

Abstract: This research presents the implementation of electronic prescribing (e-prescribing) and the expected goals of this application. E-prescribing applied relatively recently in Greece. This research examines its benefits to the doctors, to the pharmacists, to the patients and to the National Health Service. Moreover, it includes the advantages and the difficulties arising during its use. Furthermore, the research focuses on the views of the direct users of the newly introduced application: doctors and pharmacists in the Greek prefecture of Corinthia. Additionally, it describes the use and the first results of the application of e-prescribing. 90 pharmacists and 90 doctors responded in questionnaires and the results were analyzed statistically. E-prescribing is a very promising application, but it has not completely fulfilled its original objectives, due to the way it is used. Finally, there are some suggestions about the improvement of the application.

Keywords: electronic prescribing, pharmacists, National Health Service, doctors, Corinthia.

INTRODUCTION

Prescribing medicine is the second most powerful therapeutic tool in the hands of doctors, right after interventional techniques. The proper use or the misuse of it reflects on patients' healthcare. Furthermore, it has important effect on the economic viability of the health system, due to the constantly increasing pharmaceutical expenditure. In Greece, there are problems like over-prescribing and over-dispensing of drugs. Other common problems are mistakes in prescriptions' dispensing and poor compliance of patients who either do not dispense their prescriptions at the pharmacy or they do not follow the recommended treatment. Recently, electronic prescribing of medicine (e-prescribing) was implemented in Greece, in order to control and mitigate such problems and others identified by social security funds.

The purpose of this research is to present the views of those who use directly the new e-prescribing system (doctors and pharmacists) and identify the main weaknesses of the implementation. Finally, suggestions will be proposed in order to contribute to the reform actions which should take place.

REVIEW OF LITERATURE

Definition and purpose of e-prescribing

The term "e-prescribing" refers to the production, distribution and control of prescriptions and referrals for medical procedures, using computer technology and telecommunications in a way that ensures the validity, security and transparency of the information. It is a subcategory of the broad effort to introduce the e-health in patients' healthcare. Doctors enter the patient's data and the recommended medication in an automated data collection system, creating electronic (instead of handwritten) recipes[1].

The primary purpose of e-prescribing is to change the way prescriptions are created and dispensed: from handwritten to electronic. The conditions under which e-prescribing began, dictated its immediate implementation: social security funds showed a high deficit in their reserves and were at an impasse, pharmaceutical expenditure was increasing rapidly and the intended state budget was exceeded. E-prescribing is expected to mitigate the cost by reducing the actual number of prescriptions and the total cost per prescription.

The way to achieve this reduction in expenses is firstly, by choosing generic drugs (same active substance but less expensive than the original drug) and secondly, by suggesting a drug dosage which lasts for 28 days, as required by the rules of prescribing. These will reduce the current over-prescribing and over-dispensing. Furthermore, the prescription can be checked easily in order to identify and limit cases of

directed prescribing. Another promising application of e-prescribing is to derive statistical data for the general health of the population and for the efficiency of health services as the relationships between patient-doctor, doctor-pharmacist and pharmacist-patient differ greatly. Moreover, this newly-implemented system incorporates international standards and practices, while it allows third parties to develop and suggest innovative services related to healthcare[2].

Benefits for doctors

E-prescribing helps the doctor by monitoring the patient for drug combinations, for allergic reactions to specific substances and for the correct dosage in relation to age, body weight and underlying diseases. Additionally, it provides direct access to the drug formulary and to alternative and cheaper treatments for patients and the National Health Service. The doctor can check the cost of the prescribed drugs and suggest generic drugs which are equally effective with the original drug, in order to reduce the total cost of each prescription. Moreover, errors are minimized as handwritten prescriptions were usually difficult to read and sometimes there were misspellings in the name or the quantity of the prescribed drugs.

The doctor can also be informed about the dispensing of the prescription. With a simple search, the doctor can check if the patient has taken the prescribed medicine from the pharmacy, if the prescription is partially dispensed or if the patient totally ignored the suggested treatment. One more advantage is the reduction of time when a doctor wants to renew an existing prescription, as it is simple and easy and the doctor does not have to rewrite it.

Benefits for patients

E-prescribing has the potential to improve significantly the patients' healthcare and safety. It reduces errors in the prescribed medicine by eliminating illegible handwritten prescriptions and it saves the patients' time as telephone calls between doctors and pharmacists in order to clarify the prescription are no longer needed. Additionally, there are fewer difficulties in regard to the insurance coverage about the prescribed drugs, as the addition of the formulary and its constant updating help the doctor to choose drugs which are approved by the social security funds and the patient does not have to pay extra money to buy them. Furthermore, the system provides easy access in the patient's health history to doctors and hospitals.

Benefits for pharmacists

Regarding the pharmacists, the possibility of an alteration of the prescription is small, while it was easier to modify the handwritten prescription by changing the amount of the dose or the quantity of the drug, before entering the pharmacy. Moreover, e-prescribing minimizes the number of calls from pharmacists to doctors for clarification on the prescription. The explanations were mostly for the name and the form of the drug (tablet, syrup etc.) or the dosage, as this information was frequently illegible in handwritten prescriptions. Furthermore, it saves time for productive occupation of pharmacists and their staff. Reducing paperwork allows them to spend more time with the patient or to reallocate this time to activities such as drugs' inventory management[3].

Benefits for National Health Service

The National Health Service may improve greatly by the implementation of the e-prescribing system. E-prescribing reduces bureaucracy and the resources which were wasted by paperwork. Additionally, it is easier to monitor the prescribing process by each doctor and each pharmacy and there is more data available for the treatment and the health status of the patients.

Furthermore, the e-prescribing system is expected to reduce treatment costs by prescribing monthly treatment and by reducing the overall cost per prescription. In particular, in handwritten prescriptions there were many cases in which the quantity of the prescribed drugs was more than what the patient could and should have used in a month. E-prescribing provides accurate dose determination and requires written justification by the doctor in case of an overdose, in order to limit incidents of over-prescribing. In addition, if doctors replace the original drug with a generic one, the total cost of each prescription will be reduced, saving the money of the social security funds.

METHODOLOGY

Sample

The prefecture of Corinth in Greece has about 145,000 inhabitants, 250 doctors, 110 pharmacies, five health centers and a county hospital. The majority of doctors and all pharmacists use the e-prescribing system. The only reason for doctors not to use it is the lack of equipment (i.e. computer) in the health center. The large extent to which e-prescribing is used in this specific prefecture is the main reason for choosing it.

Two different questionnaires were distributed to doctors and pharmacists and the research lasted from 2011 to 2012. There were 200 questionnaires distributed to doctors and 170 were returned: 90 were answered by doctors with their own practice and 80 by doctors who work in the public sector. The researchers distributed 104 questionnaires to pharmacists and 90 of them were returned: 75 of them were distributed in urban areas and 15 in villages.

Research tools

The research was conducted using two different questionnaires: one referring to doctors and the other to pharmacists. Both included questions related to general changes which occurred after the implementation of e-prescribing. The questionnaires were distributed and collected in person in the clinic or the pharmacy, respectively, and the choice was random. All questionnaires were fully filled in by the participants.

The doctors' questionnaire was 7 pages long and it was divided into three parts: demographic information, changes they have noticed in their work and general changes in the healthcare which already took place or will take place in the future by the e-prescribing application. The first part includes demographic data like: age, gender, years practicing the profession and current workplace. The second part consists of 37 questions about the changes which occurred in their daily work by the implementation of e-prescribing. These changes relate to the necessary time they need to complete a prescription, the introduction of typing instead of handwriting, their preferences about the data entry and system changes that are likely to serve them better. The third part includes 12 questions; 10 closed-ended and 2 open-ended. The closed-ended questions were about the changes that will be made in the public healthcare, whether the new system will achieve its goals and the potential uses of the collected data. The open-ended questions were two: the first was examining whether the doctors believe that e-prescribing will achieve its original objectives and the second asked the doctors to propose changes that would improve the system, hence their work.

The pharmacists' questionnaire was 5 pages long and it was divided into three parts in the same way as the doctors'. The first part includes demographic data like: age, gender and the location of the pharmacy. The second part consists of 18 questions about the changes which occurred in their work by the implementation of e-prescribing. These changes include: the necessary time they need to process a prescription, the way they dispense the prescribed drugs, the time they need to service the customer/patient, the difficulties which they encounter when they use the application, the errors in e-prescriptions, the change in the number of prescriptions monthly and the awareness of the customers about the newly implemented system. Furthermore, the pharmacists' view of the new system, the possible results and its usefulness are investigated. In the third part there were closed-ended and open-ended questions. The pharmacists were asked about their preferences in regard to the system's interface and necessary changes that would improve e-prescribing.

Before distributing the questionnaires, the researcher asked the candidate if he/she could spare some time to answer questions about e-prescribing, noting that the answers would be anonymous and they would be used only for the purpose of the research. The questionnaires were collected in a period of 7-10 days. After the collection of the questionnaires, the data was coded accordingly and entered into the statistical program SPSS. A database was created from which it is possible to carry out studies, in order to design and transform e-prescribing into a handy and yet rich in information (about the healthcare of the population) system. Afterwards, the database was statistically analyzed.

RESULTS

Doctors' perspective

The majority of the doctors (82%) used the computer before the implementation of e-prescribing for activities related to their work, as they think of the computer as an everyday tool and internet access as an important source of scientific information. 60% of the participants said they prefer e-prescribing to the handwritten prescription, because it diminishes the paperwork for doctors and medical staff. 54% of doctors claim that there are fewer errors in prescribing, as the new system guides partially the doctor during the process. Only 46% canceled a prescription because of an error. However, 72% said that there is an increased delay in the completion of the prescription. Consequently, patients wait more and they get frustrated because of this delay. Furthermore, 37% of the doctors indicated that the time with the patient was diminished since e-prescribing consumes time.

63% answered that e-prescribing has facilitated the work of doctors. The more that they get used to the new system, the more they use efficiently the additional options that are provided by the application and they reduce the time to prescribe. About the same percentage of doctors did not change the initial treatment (besides the system's recommendations) and 73% searched for the previous prescription of the patient without altering it. 82% usually prescribed a monthly dose for the patients and 80% estimated that the number of prescriptions per month remains unchanged. 91% stated that the diagnosis should be written in text (e-prescribing uses the International Statistical Classification of Diseases and Related Health Problems –ICD-, a medical classification list by the World Health Organization) and the medication should be written in its trade name instead of the active substance from which it is composed. The search for drugs described as easy in 54% of cases and 46% thought the medicine database was outdated as it consisted of drugs which no longer exist.

The majority of doctors (72%) reported that patients wonder why they cannot use their personal formulary anymore. About half of the doctors (47%) checked whether the patient went to the pharmacy to get the suggested treatment. 75% of the doctors claimed that they take into consideration the cost of the drug when they prescribe it and they choose the less expensive. In home visits, 85% used the handwritten prescription (due to lack of the necessary equipment) and then they type it when they get to their practices. 63% agree with the printing of the e-prescription and the delivery of it to the pharmacy from the patient, as it is considered the most secure way of distributing the prescription. The same percentage believes that in long term, e-prescribing will reduce the pharmaceutical expenses and it will improve the quality of healthcare. About half of the doctors (54%) consider e-prescribing as an important application and 73% would like to use both ways of prescribing (handwritten and electronic) as there are times when they cannot access the online application.

Most doctors (73%) believe that the main effects of e-prescribing will be the monitoring of prescriptions, a long-term reduction in pharmaceutical expenditure and the improvement of the health level of the population by using the collected data. Additionally, 49% claim that bureaucracy will increase if e-prescribing will not become completely immaterial. Finally, 82% of doctors reported that e-prescribing will be an important tool for research and statistical analysis on health issues.

The most common suggestions of doctors were:

a) Secretarial support for the obstacles that occur during the operation of the system.
b) More detailed and more frequent update of the system's database to avoid the choice of non-current drugs by the doctors and medical staff.
c) The creation of an electronic health record for each patient.
d) Installation of computers in all health centers for the full implementation of e-prescribing.
e) Constant upgrades of the system in order to support the needs of doctors and patients.
f) The introduction of digital signature of the doctor to ensure the reliability and validity of the prescriptions.

Pharmacists' perspective

Both pharmacists and their staff used computers in their daily work because the registration of prescriptions to an existing database was mandatory. The majority of the pharmacists (85%) register the prescription to the new e-prescribing system but they also use the previous one. About 70% say that the time they need to dispense the drugs has increased (72%) and so is the time to service each patient (69%). 79% of the pharmacists estimate that the number of the prescriptions per month is unchanged and 57% has not observed an important alteration in the suggested treatments. However, 61% reported that they prefer electronic prescriptions to the handwritten ones and 59% of pharmacists reported that the prescriptions' errors have diminished.

Regarding the difficulties of e-prescribing, 57% said they cannot dispense the drugs because the system is offline (technical difficulties) and 69% often do partial dispense of drugs due to the lack of the prescribed medicine. The pharmacists estimate that about half of the patients/customers (47%) are not well-informed about e-prescribing. 51% of pharmacists said that they consume more time to dispense the drugs, hence they communicate less with the customers.

When asked to evaluate the e-prescription system, 72% of pharmacists consider it poorly made. Furthermore, 59% reported that the objectives of the system will not be met if there will not be functional modifications and necessary upgrades. In addition, 43% claim that the pharmaceutical expenses will stay unchanged if the majority of doctors do not choose less expensive treatments and drugs (i.e. generic drugs) and the same percentage fears that e-prescribing will not be able to reduce the cases of over-prescribing and directed prescribing.

Pharmacists prefer e-prescribing from handwritten prescription but 56% of them would prefer the electronic prescription to be immaterial (instead of the printed copy they get from the patients). Regarding the system's options, 67% prefer the diagnosis written in free text for easier communication with the customer and all pharmacists prefer drugs to be referred to by trade name.

Despite their concerns, almost all pharmacists (95%) consider the e-prescribing system as an important source of information, in case that it will be fully implemented. 73% believes it is the beginning of the computerization of health services and that this new era will continue with the creation of electronic health records for all patients. Furthermore, 85% of pharmacists claim that, if executed correctly, e-prescribing will be an important tool in the hands of pharmacists.

The most common suggestions of pharmacists were:

a) Paperless electronic prescription. Pharmacists estimate that the implementation of e-prescribing has quadrupled the paperwork.
b) On-line connection between the e-prescribing system and the Greek National Organization of

Drugs for constant updates about the dispensed drugs.

c) Link of e-prescribing with pharmacy management applications.
d) Launch of magnetic cards for all patients/customers in which all visits in healthcare providers will be recorded.

CONCLUSIONS

The results of the research indicated that despite the implementation of the new way of prescribing, the occurring changes are at an early stage. There is no full implementation due to the lack of the necessary equipment in health centers and hospitals. The success of the system depends primarily on the proper prescribing by doctors[4]. Doctors consider e-prescribing as a useful application while pharmacists identify it as poorly made and an additional way of dispensing the prescribed drugs, as the majority uses it alongside with the previous prescriptions' management program.

E-prescribing reduced errors made by doctors and pharmacists in different ways. It guides the doctors in order to properly complete the prescription and it informs them about the drugs they can choose for their diagnosis, while pharmacists read the prescriptions more easily. Electronic prescriptions are legible and they contain the full details of patients, while the handwritten prescriptions were usually incomplete. In addition, the codification of medicine using bar codes and their registration into the database system ensure that the pharmacists give the right drug during dispense. At the same time, e-prescribing diminishes the possibility of any invasive alteration of the prescription from someone except from the doctor.

It was found that doctors and pharmacists wish for some operational system changes in order to facilitate their work both in terms of time and quality. Both would prefer to have uninterrupted access to the database and they believe that the upgrade of the system is essential. The current version of the system cannot support the daily registration of prescriptions, resulting in long periods of time during which the system is out of service. Additionally, the update of the formulary should be constant so the doctors will not prescribe medicine which is unavailable.

In the future, e-prescribing is expected to reduce pharmaceutical expenses[5]. However, the implementation of e-prescribing is not sufficient by itself. The pharmaceutical expenses depend on the price of drugs and the dosage. E-prescribing does not control any of those two parameters. It is a tool for implementing doctors' decisions about prescribing and it is used as a means of testing the proper implementation of prescribing by doctors and pharmacists.

The monitoring, the control and the rationalization of prescribing combined with price regulation will ease the surging pharmaceutical expenditure. Regarding the alternative uses of e-prescribing it can be used as a source of epidemiological data for statistical analysis [6]. The dispensed drugs will be monitored by patient and area, facilitating the epidemiological analysis of a selected area. Furthermore, rare disease outbreaks might be identified in order to take preventive measures.

In conclusion, e-prescribing is a promising application, but it has not fulfilled its original objectives. As with any tool, its usefulness depends on the way it is used. E-prescribing should not be considered as a panacea and its current implementation tends to be described as a placebo. The authorities should upgrade the system and take into consideration the doctors', pharmacists' and patients' opinion if they want it to be widely accepted by the medical community.

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