MEDINFO 98
B. Cesnik et al. (Eds)
Amsterdam: IOS Press

The Electronic Patient Record in General Practice - A South-African Perspective

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Abstract

A research project was undertaken to design an electronic medical record system which will cater for the specific needs of South African general practitioners and their unique requirements. The project was launched by sending out a questionnaire to general practitioners in the Free State, trying to determine their specific requirements and to gain insight into their attitudes and opinions regarding the use of computers, especially the computer-based patient record, in a general practice setting. The results indicated that there was a need to replace the current manual patient record with an electronic version, and that the attitudes of the general practitioners in South Africa were generally favourable regarding implementing and using such a system. Given these results, we can proceed to design a computer-based patient record system, specifically addressing the needs and requirements of the South African general practitioner.

Keywords

Paper medical record; Computer-based patient record; General practice

Introduction

"A medical record is a confidential record that is kept for each patient by a health care professional or organisation. It contains the patient's personal details (such as name, address, date of birth), a summary of the patient's medical history, and documentation of each event, including symptoms, diagnosis, treatment and outcome. Relevant documents and correspondence are also included. The main purpose of the medical record is to provide a summary of a person's contact with a healthcare provider and treatment provided to ensure appropriate healthcare"[1].

Approximately a quarter of a century ago, researchers began to draw attention to the shortcomings of the paper medical record (PMR). This was due to, among other reasons, the poor organisation, incompleteness, and inaccuracy of the PMR. The increased complexity of health care and information demand, combined with the potential of computer technology, has led to a great enthusiasm for and high expectations of applying that technology to computerise the patient record. Yet, even after 25 years, with some exceptions for primary care, there is still no computer-based patient record (CPR) in wide-spread use that fully replaces the paper chart. It has been stated that, apparently, for physicians, the potential benefits of the CPR do not yet outweigh the strengths of the PMR [2].

In undertaking this research project, the authors proposed to proof the contrary. We believe strongly that the potential benefits of the CPR do indeed outweigh the strengths of the PMR. Proving that general practitioners in South Africa also see the potential benefits, would give us the go-ahead to design a prototype(s) CPR system to fulfil the specific needs and requirements of general practice.

Materials and Methods

Before designing a specific prototype/system, it was deemed absolutely necessary to gain insight into the physicians' opinions regarding the role of the computer in a general practice. In order to gain this insight, a questionnaire was designed which broadly covered the following sections; General Information, Manual System, Use of the Computer System, Problems with/ Objections against Computer-based Patient Records, and in conclusion, General Opinions regarding the Possible Success/ Failure of the Use of Electronic Medical Records in General Practice.

It was decided to use the Free State Province (a province roughly in the centre of the Republic of South Africa) as the population, because the needs in the Free State should not differ substantially from the other provinces in the country. A random sample of 150 was drawn from all the practising general practitioners in the Free State and was sent out in January 1997. Of these original 150 questionnaires, 48 were returned by mid-February. As a result of the fact that the only list of practising general practitioners we could attain, was a bit outdated, only 37 of this 48 responses could be used. The other eleven was irrelevant, because the practitioners were either hospital appointments, had already retired or are specialising at present.

After telephone follow-ups in February and March, 79 questionnaires were returned in total, of which 56 could be used (for the same reasons as mentioned above). As 23 of the total of 79 questionnaires received could not be classified as being the

opinions of general practitioners, the original sample of 150 shrunk to 127. This brought the response to 44%.

Results

The results, after coding and processing the questionnaires, are summarised according to the different sections of the questionnaire.

General Information

50% of the general practitioners taking part in the study indicated that they are engaged in a one-man practice, while the others are engaged in either a partnership or an association. The maximum number of years in general practice was 47, while the mean was 6 years and the minimum 1 year.

A computer is used in 93% of the respondents' practices, while 7% have no computer technology available to assist in their practices. Of those respondents using a computer, 52% currently use their computer for administrative purposes, 7% for dispensing, 6% for clinical purposes, and 4% for other purposes, for example for electronic data interchange (EDI) and stock control.

For the question whether or not they were satisfied with the systems currently in use, 92% of the respondents replied positively. Being a very important pre-condition for the success of CPRs, 67% of the practitioners indicated that they personally use the computer systems. Sixty five percent indicated that their receptionists use their systems, 60% that an accountant is using the systems by clerical personnel, and 31%.

Manual System

Regarding the current manual system in use in their practices, 63% indicated that they have a written task description/explanation of these systems, while 37% did not. The SOAP-scheme (Subjective, Objective, Assessment, Plan) is the scheme being used by 92% of the practitioners to record the clinical information, while the balance of 8% do not use a specific format. Similarly the "from head to toes" framework/scheme is used by 82% of practitioners, while the other 18% also indicated that they do not use a specific format.

A very important aspect regarding the possible future success of the CPR were addressed by the question "Which of the following usually applies to you when you record the clinical information of the patient?" Sixty percent of the respondents indicated that notes were made in the presence of the patient; 35% that notes were made partly in the presence of the patient and partly as soon as he/she has left the room, 4% that notes were made as soon as the patient left the consulting rooms, and 2% that notes were made at the end of each day.

Addressing the problems that general practitioners experience with their current manual systems (those aspects which a CPR should try and resolve), the problems in Table 1 were highlighted.

Additional purposes for which existing clinical manual records are used, include the drawing of statistics for personal information and for the sake of interest (27%), reminders of follow-up visits (20%), determining of health risks e.g. to determine a patient's chance of having a heart attack (16%), research regarding general partitioning (6%).

Table 1 - Problems associated with current manual systems

Problems	Physicians	% of total
Mis-filed files	32	62
Recording of external work	24	46
Separate clinical & financial systems	22	42
Time consuming	18	35
Lost files	17	33
Identifying old, unused records	16	31
Incompleteness of medical record as a whole	15	29
Durability of records	13	25
Transferability of records	12	23
Filing reports/x-rays	11	21
Delays in handling specialist/ lab reports	11	21
Duplication	7	14
Illegible/incomprehensible	6	12
Immediate recording of patient' visit	5	10
Not adaptable to changing circumstances	5	10
Unpractical format	4	8
Disorganised, files become too thick, storage of files becomes problem	3	6

Use of the Computer System

Moving on to questions regarding the use of a computer system, 55% of the respondents indicated that they would still prefer to have a printed copy of their patient's record if they should change to a computerised clinical record system. Reasons given included that a backup for the computer system was needed (43%), it is convenient to have everything close by and to have a paper copy for reference purposes (24%). Of the 45% respondents indicating that they do not prefer to have a printed copy of the patient's record, the reasons given were; that they only needed a paper copy on request (22%), a paper copy would unnecessary increase costs (56%), and that a paper copy would necessitate an extra filing system.

Asked about their attitudes towards the use of a computer in the presence of the patient during the consultation, the response varied with the majority (27%) feeling neutral about it, 25% being totally positive, 23% being moderately positive, 16% being moderately negative, and only 9% being totally negative. Those respondents feeling totally or moderately negative about using the computer in the presence of the patient during the consultation, are convinced that the patient should have the

undivided attention of the practitioner, that the patient might feel like a number on a piece of paper (impersonal), and that the practitioner will still keep paper notes.

Some of the more important motivational factors for those who are moderately or totally positively inclined are; the practitioner would prefer a pre-programmed questionnaire where he/she only have to make choices, when the patient leaves the consulting room everything (consultation, account) is concluded, CPR is seen as being fast, correct and ordered, the CPR will demonstrate the thoroughness of the practitioner, all records will be available, and that the computer is already being used in the presence of patients with great success.

Being asked in which instances the computer could be used with success in the presence of a patient, calling up a patient's medical record got the best support (86%), followed by dispensing (73%), administrative /financial applications (71%), part of the clinical examination (46%), and for statistical/graphical information (29%).

Regarding the question of the preferred methods for entering information into the computer in the presence of the patient, using the mouse was the most popular (50%), followed by typing from the keyboard (44%), speech (33%), a touch screen (24%), and a light pen (9%).

In the case where a computer system were to be used during the clinical examination; 66% of the physicians preferred to enter the information immediately in the presence of the patient; 21% preferred to make notes which they would enter into the computer later on, 4% preferred to make notes which the receptionist/ clerical personnel can enter later on.

One of the known advantages of CPRs is better communication among the health services. Response to the question asking with which parties the physician would like to establish contact through the system, indicated that pathologists and medical funds were the most popular choice (both 82%), with specialists and laboratories following closely behind (73%). Radiologists (66%), other general practitioners and pharmacies (both 47%), and hospitals (36%) also received support.

Addressing the important aspect of the data model used for designing a CPR system, the following question was put to the respondents: "Are you in favour of a guideline-based computerised patient record system, i.e. a system based on systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances?". A substantial number of respondents, namely 78% indicated that they were in favour thereof, while 22% indicated that they weren't. Six respondents did not answer the question, which might indicate them not understanding the question.

Problems with/objections against computer-based patient records

One would not get an objective view of the opinions of general practitioners regarding the CPR if one did not dare asking what problems/objections they foresaw regarding the use/functioning of such a system, as well as with its use in general practice. Tables 2 and 3 represent the responses to these two questions.

Table 2 - Problems foreseen regarding the use/functioning of a computer-based patient record system

Problem	Number of physicians	% of total
Recording of work performed outside the consulting room	31	56
Problems in linking information (e.g. hand-written reports) with system	31	56
Relationship of trust with the patient	23	42
Process of change from a manual system	23	42
Computer tasks interfering with existing normal tasks	23	42
Immediate recording of a visit	17	31
Lack of general standards regarding standard clinical vocabulary	12	22
Resistance on the part of the patients	8	15
Changed working method	8	15
Lack of general standards regarding patient identification	4	7
Not adaptable to changing circumstances	2	4
Power failures in the country side and viruses	2	4

General Opinions Regarding the Possible Success/Failure of the Use of Electronic Medical Records in General Practice.

The questionnaire was concluded with a few general questions regarding the possible success/failure of the use of electronic medical records in general practice. Asked which fields professional societies should contribute towards, 64% of the respondents felt that provision of guidelines for information in general practice was most important. This was followed by training of general practitioners in the use of information systems (58%), evaluation of existing computer systems (56%), negotiating partial compensation for system implementation with government (56%).

The Internet was also addressed in the questionnaire. Seventy three percent of the practitioners showed an interest in using the Internet, while 27% were not interested at all, reasons varying from lack of time, not important for good practising methods, lack of knowledge, to high costs. Those in favour of using the Internet, motivated their opinion with the fact that it opens an immediate "gateway" to international medicine.Testing the respondents' opinions regarding the possible success of a CPR system, 91% were of the opinion that it can be successful, while 9% believed the contrary. This was motivated mainly by a fear of the influence of computer illiteracy. Quite a number of reasons were given for giving the CPR a fair chance of success.

Table 3 - Problems foreseen with/objections against computer-based patient records in general practice

Problem	Number of physicians	% of total
Cost : Initial capital investment	34	61
Time : Duration of patient encounter	31	55
Computer illiteracy	26	46
Time : Training	24	43
Security	24	43
Time : Use of the system	19	34
Software	18	32
Ethics	16	29
Hardware	15	27
Cost : Operating cost	11	20
Quality of information	10	18
Personnel	9	16
Lost information, linking with other institutions	3	5
None of the above	1	2

The most important reasons being that the CPR is more organised, that success will depend on the software and operators, the record will always be available, and that the implementation of the CPR will ease general practice keeping.

If a good CPR system were to be available, the respondents were asked whether or not they would use it. Ninety one percent replied positively, while the other 9% declined. Those responding positively towards the principle, stated that it would, however, depend on the cost and implementation.

Discussion

Given a response of 44%, one might argue that the questionnaire was completed by general practitioners who are positively inclined towards computers. Those who do not like computers, who are computer illiterate or who are sceptical about the use of computers in general practice, most probably constitute a substantial percentage of the 56% practitioners who did not respond. Looking at the distribution regarding the number of years in general practice, also indicates that most of the respondents are relatively young (mean of 6 years). These facts might indicate that the results of the processed questionnaires would be slightly biased towards computer-use. Of the 56 respondents, only 4 do not use a computer in their practices at all.

The sample is, however, well represented as far as the nature of the practices (one-man practice or partnership/association) are concerned. It is interesting to note that 50% of the respondents have urban-practices, while 50% have country-practices.

The results show that computer use in general practice in the Free State is limited to administrative purposes. The lack of integration with clinical records are therefore also one of the reasons given for not being satisfied with the system currently in use. Only 6% of the respondents indicated that their systems are used for clinical purposes also. All this shows that the design and implementation of CPR systems in the Free State, and therefore in South Africa, is a barren field with a lot of potential to explore.

To be successful, it is crucial that the practitioner will personally use a CPR system. The fact that 67% of the respondents indicated that this was the case with their current computer systems, may be a positive indication regarding the attitudes, willingness and computer literacy of general practitioners, which will be very important when implementing a CPR system.

Using their current manual clinical record systems, 60% of the practitioners indicated that they take notes in the presence of their patients. The conclusion can be made that this method would be preferable when using a CPR system as well.

The majority of attitudes towards using a computer in the presence of a patient, being neutral, moderately positive or totally positive, can be interpreted as a go-ahead in designing a CPR system. It should, however, be born in mind that the system should be designed in such a way that the practitioner would still be able to make the patient feel as if he/she is the most important person in the consulting room. The computer system should complement the consultation, rather than dictate the consultation. There are scepticism among practitioners regarding the use of a computer in the presence of the patient. This was illustrated by the response of only 46% towards using the computer as part of the clinical examination. This might be because of fear of the unknown. Practitioners do not seem to have any problem with using the computer in the presence of the patient to call up a medical record, for dispensing, or for administration/financial applications. When given a situation where a computer is used as part of the clinical examination, it is positive to note that the practitioners would prefer to enter the information immediately in the presence of the patient, as is the case with the use of their current manual systems.

Looking at the user interface of a CPR system, it is interesting to note that practitioners still prefer using a mouse and the keyboard. This would indicate a graphical user interface. There are, however, concern regarding the lack of typing skills, and this should be taken into account. Based on the response received on the matter, communication channels with other health professionals is a must in a CPR system.

Practitioners do foresee problems with the use/functioning of CPR's. Their main concerns revolve around practical implementation problems in changing from a manual to a computer system. The main concern regarding CPR's in general practice, is the initial capital investment. This is a very important point, especially when considering the type of computer system to develop. In order for a computer system to be successful, it should be used, and therefore should be affordable to the average general practitioner. The prospective system should be designed in such a way that the duration of the patient encounter would not considerably be influenced by it.

The fact that 91% of the respondents were of the opinion that a CPR can be successful, and that 91% of them indicated that

they would use such as system, if it were available, is enough motivation to start the daunting task of designing such a system.

Conclusion

By sending out the questionnaires, we wanted to determine whether a need for a CPR system existed in South Africa, and if it did what the requirements would be. The response to the questionnaire gave us exactly that.

We learned that the general practitioners in South Africa realised the need for implementing computers in their practices. As is the case in many parts of the world, they do experience frustrating problems with their current manual systems. The computer systems currently used in general practice, mainly focus on administrative duties, and there is a need to integrate these functions with clinical CPR's.

The practitioners indicated that the type of system they would consider implementing should be graphically based, using the mouse and keyboard (and in future, voice) for entering data. It should be able to handle images, prescriptions, and should be able to facilitate communication to various other roll players in the health industry. Despite the fact that there is concern about the patient not getting the practitioner's undivided attention, most practitioners felt that they would be able to use the computer in the presence of the patient, and that they would prefer to enter the clinical information immediately in the presence of the patient. The practitioners are also willing to use the computer systems personally, an aspect which is considered to be of the utmost importance for the success of the CPR.

Despite some problems that are foreseen, we are left with a clear impression that general practitioners believe in the concept of the CPR, that they definitely feel a need for it and that they would use it, when available. We can now progress towards designing a CPR system to try and fulfil the needs of general practitioners in South Africa.

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