

Artigos originais

Electronic medical records: perceptions from speech-language-hearing pathology undergraduate students and professionals

Prontuário eletrônico em cenário de prática: percepção dos graduandos e profissionais de fonoaudiologia

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ABSTRACT

Purpose: to investigate the perception of Speech Therapy professionals and graduating of a low and medium complexity's service regarding the use of electronic Medical Records in clinical practice.

Methods: participated 51 users of PE, of which, 45 graduating of 6th and 8th period (G1) and 6 speech therapists (G2). All answered a survey directed. For the statistical analysis, it was used the Fisher's exact test and the calculation of absolute and relative frequencies of the answers.

Results: the use of Medical Records as standardized and institutional electronic tool was considered by students and speech therapists, respectively as organized and dynamic (60,00% and 33,33%), of an easy handling (80,00% and 83,33%) and efficient regarding the physical medical records (60,00% and 66,67%). As for the use/benefit, it was considered a facilitator for clinical care (G1=82,22%; G2=100,00%), benefiting users and professionals (G1=80,00%; G2= 100,00%).

Conclusion: the participants considered the Medical Records as an appropriate institutional and standardized electronic tool, more effective compared to physical medical records and that benefited the clinical attendance of speech therapy in the service of low and medium complexity. It was verified that there were differences in the way users perceive the Medical Records. The professionals were more satisfied the appropriateness of this tool to the needs of care to register the clinical course and content of the data entered in this record and less satisfied with the existence of faults, compared to graduates.

Keywords: Medical Records Systems, Computerized; Information Technology; Health Personnel; Clinical Clerkship; Speech, Language and Hearing Sciences

RESUMO

Objetivo: investigar a percepção de graduandos e profissionais de Fonoaudiologia de um serviço de baixa e média complexidade em relação à utilização de prontuário eletrônico na prática clínica.

Métodos: participaram 51 usuários do prontuário, dos quais, 45 graduandos do 6º e 8º período e seis fonoaudiólogos. Todos responderam a um questionário dirigido. Para a análise estatística, utilizou-se o teste exato de Fisher e o cálculo das frequências absoluta e relativa das respostas.

Resultados: a utilização do Prontuário enquanto ferramenta eletrônica padronizada e institucional foi considerada por estudantes e fonoaudiólogos, respectivamente como, organizada e dinâmica (60,00% e 33,33%), de fácil manuseio (80,00% e 83,33%) e eficaz em relação ao prontuário físico (60,00% e 66,67%). Quanto ao uso/benefício, foi considerado um facilitador para o atendimento clínico por 82,22% dos estudantes e ; 100,00% dos fonoaudiólogos, trazendo beneficiando usuários e profissionais (G1=80,00%; G2= 100,00%), com redução do tempo de espera pelo atendimento (G1=42,22%; G2= 50%).

Conclusão: os participantes consideraram o Prontuário Eletrônico como uma ferramenta eletrônica padronizada e institucional adequada, mais eficaz em relação ao prontuário físico e que beneficiou o atendimento clínico fonoaudiológico no serviço de baixa e média complexidade. Verificou-se que houve diferença na forma que os usuários percebem o Prontuário Eletrônico. Os profissionais mostraram-se mais satisfeitos à adequação desta ferramenta às necessidades do atendimento para registrar a evolução clínica e ao conteúdo dos dados inseridos neste registro e menos satisfeitos com a existência de falhas, comparado aos graduandos.

Descritores: Sistemas Computadorizados de Registros Médicos; Tecnologia da Informação; Profissional de Saúde; Estágio Clínico; Fonoaudiologia

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INTRODUCTION

The recording of clinical and laboratory activities in the medical chart is necessary to characterise the level of population health, to enable the development of models and policies for healthcare and management of healthcare organisations and to subsidise teaching and research in the healthcare process ¹.

The Federal Medical Board resolution number 1638 ² defines medical record as a unique document consisting of a set of data, signals and images recorded based on facts, events and situations regarding the patient's health and care provided, which is of legal, confidential and scientific nature.

A typical and relatively diffuse application of information management is the use of electronic medical record (EMR), which enables quick and clear access to clinical information ³ by helping the practitioner in the healthcare process, record collection and storage, and data exchange among institutions ^{4,5}. Among the most positive features of the use of EMR are the reduction in the amount of stored papers and physical space, long-term storage of data collected, reduction of redundant tasks, decrease in the occurrence of behavioural faults, improvement in the work productivity, real-time access to patient medical records and satisfaction of the practitioners ^{6,7}.

The incorporation of new digital technologies into the practice of different healthcare professionals has caused changes in the undergraduate and postgraduate education as both expansion of these resources and access to internet have also been widely incorporated into the healthcare routines ⁸. These innovations and the globalised electronic media have become part of the contemporary social and occupational life ⁹.

Computerising the diagnosis and rehabilitation processes requires co-operation and engagement of the professionals ^{10,11} for previous appraisal of the records and consensus on the content, including ethical, legal and social issues regarding the EMR system ⁶ and adherence to data standardisation of the medical records ¹².

Important issues regarding the implementation of EMR should be addressed, such as resistance of professionals and managers to the use of technology as a unique way to generate clinical information ¹³, development and adequacy of the EMR to different healthcare fields ¹⁴, implementation cost of the system and equipment ⁷, and maintenance and qualification of personnel ¹⁵.

A literature review on national databases has evidenced the lack of reports on the use of EMR for speech therapists. The exception is a study in which the author promotes a reflection on information production and clinical use in the speech-language field, such as chart recording and use of computing system based on an implementation experienced in a city in the State of São Paulo ³. Other studies on the use of computerised tools for speech-language pathology have focused on therapeutic purposes only ¹⁶⁻¹⁸, thus limiting information which might favour access, storage and organisation of the medical records. All these are necessary to ensure a continuous, effective and qualified service aimed at patients, research and management.

The use of computers for follow-up of patients and documentation of clinical information represents an innovative change and, at the same time, a challenge for practitioners, faculty members and trainees in the healthcare field. The use of technology and computing systems has been widely encouraged and discussed by the Ministry of Health. Also, it is currently possible to develop a low-cost EMR requiring only minimal training for use ¹⁵.

The local integrated rehabilitation centre provides speech-language services and it is a professional practice scenario for undergraduate students as electronic information systems (for appointments and medical records) have been used since 2010. The consulting rooms are equipped with computers and internet, thus allowing implementation of several electronic tools aimed to assist care and teaching-learning in the fields of clinical audiology, diagnosis and rehabilitation.

The objective of the present study was to investigate the perceptions of speech-language pathology undergraduate students and professionals about the use of electronic medical records in the clinical practice.

METHODS

The present study has been approved by the Research Ethics Committee of the Clinics Hospital of the Ribeirão Preto School, University of São Paulo, according to protocol number 5719/2011.

The participants of the study were selected among sixth and eighth-year undergraduate students of speech-language pathology in 2011 as well as among speech therapists working in the clinic area. Both students and professionals were invited to take part in the study while the researchers informed them about the theme, objective and collection procedure,

with the 51 participants selected signing an informed consent form. They were divided into two groups: G1, consisting of 45 female participants with mean age of 21 years old, of which 26 (50.9%) were sixth-year undergraduate students and 19 (37.2%) were eighth-year undergraduate students; and G2, consisting of six female speech-language therapists with mean age of 32 years old.

Next, the participants completed a directed questionnaire, which was elaborated following a literature review. The questionnaire consisted of instructions and items on the participants' knowledge on the use of electronic recording tools (Part A) and their satisfaction with EMR in the service (Part B), which addressed two sub-parts: usage of EMR itself (Sub-part A) and its benefits (Sub-part B). A Likert-type scale was established so that the participant might mark one of the following options: 1) I agree, 2) I cannot opine, 3) I agree partially, and 4) I disagree. Data collection

was performed in the local facilities on an individual basis and without interference of the researchers. The Fisher's exact test was used to assess the association between categorical variables (Sub-parts A and B) and participants (students and professionals), including calculation of absolute and relative frequencies, for descriptive analysis of the data from the questionnaire. The significance level was set at 0.05 ($P \leq 0.05$).

RESULTS

With regard to the participants' knowledge on the use of electronic recording tools (Part I), it was found that the majority of the participants had a computer (G1 = 97.77% and G2 = 100%) and access to internet (G1 and G2 = 100%). Electronic resources has been used by students to develop reports, completion course-works, seminars and article research, whereas therapeutic planning and patient clinical evolution were the tasks mostly performed by the professionals (Table 1).

Table 1. Characterisation of the participants' knowledge on the use of electronic recording tools (Part A).

	Have a computer (n)		Have access to internet (n)		Use of electronic tool in the clinical practice (n)		Activities developed with technological resources (n)						Daily use of the computer (Hours)				
	Yes	No	Yes	No	Yes	No	Reports	CC*	WS	Studies	AR	TP	UE	NR	Min.	Mean	Max.
G1	44	1	45	0	44	1	14	7	8	7	22	3	1	14	1.5	3.9	9
G2	6	0	6	0	6	0	0	0	0	0	0	4	5	2	2	8	10
Total	50	1	51	0	50	1	14	7	8	7	22	7	6	16	3.5	11.9	19

Notes: (*) Data on G1 only; CC = Completion coursework; WS = Works/Seminars; AR = Article research; TP = Therapy Planning; UE = User's evolution; NR = No response

With regard to the participants' satisfaction with EMR in the clinical practice (Part B), the Sub-part A showed that EMR was regarded an organised and dynamic tool (60.00% and 33.33%) and more effective compared to physical medical records (60.00% and 66.67%). For 80.00% of the students and 83.33% of the professionals, EMR is easy to handle as they adapted to it quickly (G1 = 68.89% and G2 = 66.67%) (Table 2).

With regard to the use/benefit (Part B), G1 (82.22%) and G2 (100.00%) showed that the use of EMR facilitated the clinical management by not only benefiting both users and practitioners (G1 = 80.00% and G2 =

100.00%), but also by reducing the waiting time for care in the public healthcare system (G1 = 42.22%; G2 = 50%) (Table 2).

There was a statistically significant difference ($P \leq 0.05$) between the groups in the way users perceive the EMR regarding the content addressed in Part A. The professionals were shown to be more satisfied, compared to the undergraduate students, with the adequacy of the EMR to record clinical evolution (A2) and to enter data (A3), but less satisfied with the existence of failures (A10).

Table 2. Participants' satisfaction with the electronic medical record implemented in the service.

Variables	Part A												Fisher's test *p≤0.05
	I disagree		NO				PA		I agree		Fisher's test		
	N (%)		N (%)		N (%)		N (%)						
Theme: Institutional standardised electronic tool	G1 (n=45)	G2 (n=6)	G1 (n=45)	G2 (n=6)	G1 (n=45)	G2 (n=6)	G1 (n=45)	G2 (n=6)	G1 (n=45)	G2 (n=6)			
Adequacy of the fill-up time (A1)	9 (20.00)	0 (0.00)	2 (4.44)	0 (0.00)	25 (55.56)	3 (50.0)	9 (20.00)	3 (50.0)	0.3686				
Adequacy of the recording of the clinical evolution (A2)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	11 (24.44)	6 (100.0)	34 (75.56)	0 (0.00)	*0.001				
Adequacy of the content of clinical evolution for the needs of the care service (A3)	4 (8.89)	0 (0.00)	0 (0.00)	0 (0.00)	20 (44.44)	6 (100.0)	21 (46.67)	0 (0.00)	*0.0425				
Difficulty of handling (A4)	36 (80.00)	5 (83.33)	1 (2.22)	0 (0.00)	7 (15.56)	1 (16.67)	1 (2.22)	0 (0.00)	0.99				
Adequacy of the clinical evaluation record (A5)	0 (0.00)	0 (0.00)	2 (4.44)	0 (0.00)	18 (40.00)	5 (83.33)	25 (55.56)	1 (16.67)	0.1535				
Adequacy of the electronic scheduling (A6)	0 (0.00)	0 (0.00)	1 (2.22)	0 (0.00)	13 (28.89)	2 (33.33)	31 (68.89)	4 (66.67)	0.99				
Access to the user's history (A7)	1 (2.22)	0 (0.00)	1 (2.22)	0 (0.00)	14 (31.11)	2 (33.33)	29 (64.44)	4 (66.67)	1.0000				
Effectiveness of the physical medical chart (A8)	27 (60.00)	4 (66.67)	2 (4.44)	0 (0.00)	10 (22.22)	1 (16.67)	6 (13.33)	1 (16.67)	1.0000				
Organisation & dynamics (A9)	0 (0.00)	0 (0.00)	1 (2.22)	0 (0.00)	17 (37.78)	4 (66.67)	27 (60.00)	2 (33.33)	0.3147				
Existence of failures (A10)	20 (44.44)	1 (16.67)	11 (24.44)	0 (0.00)	9 (20.00)	2 (33.33)	5 (11.11)	3 (50.0)	*0.0403				

Variables	Part B								Fisher's test *p≤0.05		
	I disagree		NO				PA			I agree	
	N (%)		N (%)		N (%)		N (%)				
Theme: Use /Benefit	G1	G2	G1	G2	G1	G2	G1	G2			
Makes care easier (B1)	1 (2.22)	0 (0.00)	0 (0.00)	0 (0.00)	7 (15.56)	0 (0.00)	37 (82.22)	6 (100.0)	0.6259		
Benefits for users and professionals (B2)	1 (2.22)	0 (0.00)	0 (0.00)	0 (0.00)	8 (17.78)	0 (0.00)	36 (80.00)	6 (100.0)	0.6221		
Decrease in the waiting time (B3)	4 (8.89)	2 (33.33)	6 (13.33)	0 (0.00)	16 (35.56)	1 (16.67)	19 (42.22)	3 (50.00)	0.3068		
Professional adaptation (B4)	1 (2.22)	0 (0.00)	0 (0.00)	0 (0.00)	13 (28.89)	2 (33.33)	31 (68.89)	4 (66.67)	0.99		
Disadvantage to professional interaction and user (B5)	41 (91.11)	6 (100.0)	1 (2.22)	0 (0.00)	2 (4.44)	0 (0.00)	1 (2.22)	0 (0.00)	1.0000		

Notes: NO: No opinion; PA: Partially agree

DISCUSSION

Mean time spent and activities performed with computers (Table 1) are indicators that the participants have incorporated these technologies into their daily-life routines⁸, which are necessary to carry out their academic and professional tasks satisfactorily. These findings can also be regarded as facilitators because they help in the process of adaptation, involvement and cooperation regarding the use of EMR by students and professionals in the clinical practice (Table 2, A4), since

elementary computing skills (e.g. basic notions on computer usage and data typing)⁷ are required. They also represent important aspects as the professionals' resistance to computer usage in clinical and hospital settings^{13,15} and the need to enable them to use such resources are obstacles to the implementation of EMR systems into other healthcare services^{7,15}.

One cannot just think that the contemporaneous globalisation has allowed everyone to have equal access to internet and computer, since the access to

these technologies depends on public policies such as broadband internet access and lines of credit to acquire equipment. Despite the technological advances and the crucial importance of implementing EMR systems into healthcare services, some problems are recurrent such as lack of consensus on the contents to be used, disaggregation of the organisational environment, and ethical, legal and social issues⁶. Therefore, the manager should also be concerned with investing in training and education on a permanent basis by collaborators so that electronic resources can be accepted and incorporated as a daily work tool⁴.

The speech-language professionals had been previously trained for the usage of the proposed electronic tool, which consisted of electronic patient chart and appointment scheduling. During the training period, it was determined which clinical information would be needed for clinical evaluation. The EMR system is periodically adjusted so that it can be suitably used for the local needs, since this tool was developed as a medical model. The undergraduate students were trained on the operational procedures of the electronic information system and then they met the local supervisor to clarify doubts on the available electronic resources.

When implemented for educational purposes, computing systems should be aggregated to the student's environment and reality not only as a tool, but also as a resource for curricular activities. This means that the faculty, encouraged by the teaching institutions, need to redirect their didactic background by learning to use new tools and adapting their attitudes and stances towards the world, knowledge and teaching process. Therefore, faculty should be receptive to changes by re-adapting their knowledge to a new reality, facing challenges and meeting the diversity that the new educational scenario demands¹⁹.

It was found that the majority of the participants have agreed that there was a decrease in the waiting time *per care session* (B3). In addition, electronic scheduling and access to clinical information on a real-time basis are two features of the EMR system which might be contributed to such a result, since the analysis of these institutional information could improve both productivity and quality of the service provided⁴⁻⁷.

The electronic scheduling, which is suitable for the participants of the preset study (A6), is an important management tool as it generates a reliable report on the time elapsed between the arrival of the user to the service and the beginning and end of the care session.

In institutions in which electronic systems are used, as is our case, we also have information on when the service was ordered and how it was provided.

The institutionally-normalised and standardised protocols for filling up electronic charts have been adjusted for clinical use in terms of service execution (A2), fill-up time (A1), data content (A3) and access to the user's history records (A7), always in accordance with the participants' opinions (Table 2).

One of the challenges of the EMR system is to adapt these protocols to the time availability and ability of both collaborators and undergraduate students who use computing resources¹³⁻¹⁵. The option to reserve the final five minutes of the care session to record clinical information, according to reports in the literature³ and incorporated into our routine, was perceived as being enough. These findings have also shown that it is possible to conciliate effectively the daily recording by using an electronic system, so long as information is written with precise and coherent content during the reserved time, thus fulfilling the professional and educational needs. Moreover, the EMR system may have contributed to the benefits to users and professionals in terms of effectiveness of the care, which was evidenced in our results (Table 2, B1; B2).

In order to record information precisely and reliably³, it is necessary that the users perceive the EMR as a legal and institutional document representing the actual therapeutic evolution during several care services provided.

In view of this, the policies developed to normalise information on the daily evolution of this service were based not only on the research on documents from the Federal Board of Speech-Language-Hearing Sciences, but also on a wide discussion with the speech therapists by addressing the following issues: objective of the intervention, results obtained, behaviour, referrals, orientations, user's doubts, interurrences, and follow-up appointments³. All these were defined as being essential contents. Both professionals and undergraduate students were instructed to avoid polysemy and ambiguity in writing their texts by using a vocabulary appropriate to their scientific-technical area³.

In the present study, there was a significant difference between professionals and undergraduate students regarding their perception of the adequacy of the EMR system for recording clinical evolution as well as for providing information to meet the care needs. One explanation for this finding may be the

professionals' clinical experience and their constant use of this tool, since all the participants of G2 work 30 hours *per week* in the service and attend to 35 users, whereas the undergraduate students perform local tasks 10 hours *per week* and attend to four users on average.

Considering that having recourse to the user's past history is a necessity for healthcare professionals, which may reflect on the quality of the care provided (1), the results obtained reinforce those reports stating that the use of EMR promotes transparency and rapid access to the information stored (3-5). It is greatly valuable to interpret data on a precise basis – facilitated by a well-elaborated content, since it enables information to be integrated so that one can guide the processes of evaluation, diagnosis, speech therapy planning and further assessment, which would shorten time and distance. This would bring professionals from different institutions together and promote integration between care and health.

Although the participants have reported that the EMR system facilitated the access to the user's medical history, making information exchange easier, fast and secure and consequently improving the quality of the healthcare ^{6,7}, there was no significant difference between the groups regarding the report that EMR is more effective than the physical ones (Table 2, A8), including benefits resulting from their use. Moreover, the professionals perceived the existence of failures in the EMR system, whereas the students did not identify any problem. The EMR systems should be adjusted to the specificities of each area. However, the information technology systems for healthcare are mostly developed for medical purposes, and when in use, they are adapted to the needs of other healthcare professionals. For services involving multidisciplinary teams, it is necessary to ensure that the EMR systems meet the recording demands inherent to each speciality regarding the diversity of information generated, including formal recording in medical charts. In the speech-language service, for example, it is necessary to record and store vocal analysis (and its phonetic transcription), phonetic inventory, writing samples of the patient, among other data. However, the way how recording on paper is done is not always suitable for electronic systems.

It should be emphasised that despite the technical limitations in the use of EMR systems for the specificities of each area, the participants perceived that the tool was more effective in terms of organisation and

use compared to the physical medical record as daily needs were met and care was improved accordingly. These indicators also show that further research on healthcare should be supported.

Therefore, it is expected that the positive contribution, as evidenced by the therapists' and undergraduate students' acceptance of the EMR system and whose aim is to improve the quality of healthcare, research and management, can sensitise those professionals and managers who are resistant to its implementation.

CONCLUSION

The participants have considered the EMR system as a standardised and institutional tool, which was shown to be adequate and more effective in relation to the physical medical record and whose implementation has improved the low/medium-complexity services in the clinical practice. It was also found that there was a difference in the way users perceived the EMR, since the professionals reported to be more satisfied with the adjustment of the tool for recording the clinical evolution, although they had perceived the existence of failures.

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