

## ORIGINAL ARTICLE

# ELECTRONIC MEDICAL CHARTS FOR CARE MANAGEMENT IN FAMILY HEALTH TEAMS

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#### **ABSTRACT**

Objective: to understand the use of the Citizen's Electronic Medical Chart for Care Management in Family Health teams. Method: a case study with a qualitative approach, using the Care Management dimensions as its theoretical framework. It was conducted from March to June 2019 in two municipalities from Minas Gerais, Brazil, with 37 professionals working in the Family Health Strategy, by means of interviews and direct observation. Data analysis was performed through Content Analysis, Thematic-Categorical modality, and systematized in the MaxQDA program. Result: the results indicated that use of the Citizen's Electronic Medical Chart takes place in three Care Management dimensions, namely: professional, organizational, and systemic. Conclusion: the study contributes to the reflection on the importance of a perspective that permeates the several Care Management dimensions in the Family Health Strategy teams' routine, given the introduction of the Citizen's Electronic Medical Chart.

**DESCRIPTORS:** Electronic Health Records; Management in Health; Primary Health Care; Family Health Strategy; Health Information Systems.

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## INTRODUCTION

Throughout the last decade, there has been an abundance of initiatives by the Brazilian Health Department (Ministério da Saúde, MS) focused on strengthening the infrastructure of Primary Care (PC) in Brazil and on improving the quality of health information. It was in this context that the e-SUS Atenção Básica (e-SUS AB) Strategy was created in 2013, currently called e-SUS Atenção Primária (e-SUS APS)<sup>1-4</sup>.

The e-SUS APS Strategy consists of a set of actions aiming to computerize Basic Health Units (BHUs), integrate information, and systematize data collection, in achieve the materialization of a new information management model that supports health services, contributing to the effective management of PHC and to the qualification of care to users and of organization of professionals' work<sup>2-4</sup>. With regard to its software systems, it has Simplified Data Collection (SDC) and Citizen's Electronic Medical Chart (CEMC)<sup>2</sup>.

In fact, the implementation of CEMC leads to structural changes and in health care professionals' practice, because it consists of a technological process innovation that involves the building of a new care and work organization model<sup>3-4</sup>. Considering this scenario of changes, the introduction of the CECM is expected to have an influence on Care Management in Family Health teams.

Care Management is defined as the provision of health technologies, considering the unique needs of people in the different stages of their lives, with the view of promoting well-being, safety, and autonomy. Care Management takes place in multiple and indivisible dimensions: individual, family, professional, organizational, systemic and societal<sup>5</sup>.

The individual dimension of Care management represents "self-care", which means that each individual has the ability to lead their own life through their choices. The family dimension is broader and its actors are family members, friends and neighbors. The professional dimension involves the encounter between professionals and users. The organizational dimension is materialized in the health services. The systemic dimension is where networks or care lines are formed, built through formal, regular and regulated connections between health services, aiming to ensure integrality in health care. Finally, the broadest Care Management dimension, the societal one, takes place in the way in which each society produces citizenship, the right to life and access to the consumption modalities<sup>5</sup>.

Studies indicate that the introduction of the electronic medical chart in health services has brought benefits to health care, such as: improvement in systems of disease surveillance and monitoring, support to clinical decision-making, improvement in management of patients' health information, among others<sup>6-7</sup>. Conversely, the literature also reports challenges, such as: high cost, lack of technological support, lack of infrastructure, resistance from professionals, distancing between professionals and patients, among others<sup>8</sup>.

Given these statements, it is considered relevant to understand how the CEMC has been used for Care Management in Family Health teams Such understanding is essential to obtain diverse information that assist the teams in planning their actions. In this sense, the overall study objective was delimited as understanding the use of the Citizen's Electronic Medical Chart for Care Management in Family Health teams.

## **METHOD**

This is a case study with a qualitative approach, which enables to discover the individual particularities and experiences through the meanings attributed to experiences,

common sense, and actions<sup>9</sup>. The case study was used as the methodological framework, since the research question consists of a contemporary phenomenon inserted into a real context<sup>10</sup>. The theoretical framework included the Care Management dimensions described by Cecilio<sup>5</sup>: individual, family, professional, organizational, systemic and societal.

The research locus consisted in two municipalities from a health micro-region in Minas Gerais, Brazil. The municipalities included were those with the CEMC implemented and in use by the professionals in at least one Basic Health Unit (BHU). Two of the 24 municipalities that comprise the Micro-region met the inclusion criterion. Through a draw, the first two were included in the study. In each municipality, one BHU was randomly selected and, out of a total of 40, the study included 37 health care professionals who used the CEMC in their work routine and who were present at the time of data collection. The professionals excluded were those who were on vacations, time off or leave on the collections dates. Thus, three were excluded.

The health care professionals participating in the study consisted of three Nurses, seven Nursing Technicians, three Physicians, 19 Community Health Agents, two Dentists, two Oral Health Technicians, and one Oral Health Assistant.

The sources of evidence for this study were the interviews and direct observation, in addition to a structured questionnaire to identify the participants' profile. Data collection took place in each municipality during a typical working week between March and July 2019. The interviews were conducted in the premises of each BHU, in individual meetings with each participant in a private place, guided by a semi-structured script and audio-recorded. The questions that comprised the interview script were as follows: Please tell me about your perception about the use of the CEMC in Primary Care; and How do you use the CEMC for Care Management?

At the end of collection, interviews were transcribed in full and identified by the acronym corresponding to participant's professional category, followed by the number corresponding to the order of the interviews. The acronyms were NUR (Nurse), NURT (Nursing Technician), PHY (Physician), DEN (Dentist), CHA (Community Health Agent), OHT (Oral Health Technician), and OHA (Oral Health Assistant).

The observation was of the direct type, targeted at the context in which the CEMC was used, and took place informally throughout the field visit, even during the interviews. The diverse information collected through direct observation were recorded in a field diary as observation notes and contained annotations about the researcher's perception at the data collection moment. They are identified in the results by the ON acronym, followed by the number corresponding to the presentation order (ON1, ON2...).

The data were organized and analyzed by means of the Thematic-Categorical modality of Content Analysis. <sup>11</sup> The MAXQDA software, version 2018, was used to systematize the analysis. The material was organized in the pre-analysis phase. The interviews and observation notes were imported into MaxQDA and the floating reading of the material was performed immediately afterwards. In the following phase, exploration of the material, text clippings of the text into registration units were made; coded, these units generated the meaning nuclei (researcher's interpretation). The thematic categories emerged from convergences in the meaning nuclei, namely: "How to use the CEMC in the Care Management organizational dimensions" and "How to use the CEMC in the Care Management systematic dimensions". These categories represent three of the six dimensions described<sup>5</sup>.

In the third phase of the analysis process (treatment of the results), the unprocessed results were interpreted in order to turn them significant and valid, respecting the inference of the interviews and observations and the interpretation of concepts and proposals. Another researcher was in charge of the second data analysis, for their validation. After the analysis, feedback was offered to the respondents, so that they could also validate it.

The project was submitted approved by the Committee of Ethics in Research with Human Beings, under opinion No. 3,297,521. The interviews took place upon acceptance and signature of the Free and Informed Consent Form, as provided for in Resolution 466/12 of the National Health Council. Thus, the data collected were treated confidentially and used only for the purposes of this study.

#### **RESULTS**

In relation to the participants' profile, it was noticed that 29 (78.4%) are female and that the predominant age group corresponds to individuals aged from 31 to 40 years old (19, 51.3%), followed by individuals aged from 20 to 30 years old (nine, 24.3%). Regarding schooling, 24 (64.9%) have Complete High School, 10 (27%) have Complete Higher Education, six (16.2%) are Graduates, and three (8.1%) have Complete Elementary School.

Regarding the time of the first contact with the CEMC, the majority indicated contact two years ago (21, 56.7%) and three years ago (13, 35.1%). One interviewee reported having had contact four years ago, and two had had such contact less than one year ago.

## Use of the CEMC in the Care Management professional dimension

In this dimension, where the encounter between professionals and users of the health system takes place, some reports indicated that the CEMC allows the professional to know the users more in-depth, by means of diverse and more complete information that enable distinguishing their characteristics and health situations.

I think that the home visit, knowing what it is that the person has, if he's hypertensive, diabetic, then I know all that through the electronic chart [...] with the electronic chart we get more in-depth. (CHA7)

It's a way for us to get to know the patient better, of knowing better... anyhow I said, the CEMC has a lot more information about the patient, when I get to his home I already know half his life [...]. (CHA12)

The following report and ON1 reveal that the CEMC contributed to monitoring the users and their appointment history, in addition to facilitating knowledge of the health situations present in the territory.

When I open the care screen there and I'm about to initiate my patient's appointment, I see the last time that he went to the doctor, his last vaccine, the last time he saw me, then it's useful as a control, both of my service and of the patient in general [...] (DEN1)

It was easy to perceive the CHAs' satisfaction with the new recording modality through the CEMC, which was manifested through the excitement about the ease recording and accessing the patient's data. (ON1)

Despite the satisfaction expressed, the time spent in using the electronic medical chart exerted negative impacts on the professional-patient relationships.

I resisted this program at the beginning because I always preferred providing care to the patients and, whether you like it or not, you gradually enter the things here and stop looking at the patient, you stop paying attention to some things in the patient and some patients feel uncomfortable many times. (PHY3)

When talking about deviations from the care provided to the patient while using the CEMC, some changes in some participants' tone of voice and facial expressions were noticed,

which revealed how uncomfortable they felt when experiencing this dilemma. (ON2)

## Use of the CEMC in the Care Management organizational dimension

In this dimension, performed in the health services and where organization of the work process assumes a central place, we identified that the CEMC has contributed to improving the organization of the care flow, both for planning and for care quality.

[...] all those who go there go through screening, the nurse, a pre-consultation by the technician, then I think that it more than improved, it allowed better planning, it even improved the quality[...] with the CECMI think that it more than improved, even management of the BHU is working better, because we can plan care. (NUR2)

It is also a way for us to know that a patient came to the unit, because sometimes we're here assisting someone, we look at the computer and already know that we have a patient waiting, and then when the patient is already past the initial interview, we already know how severe it is. (NUR3)

Strengthening of the interprofessional communication and between the Municipal Health Secretariat and the FHS teams was also identified in this dimension.

[...] for example, I'm taking care of you, then I think that your problem is not only in your mouth [...] then I immediately send to the doctor from here and he already sees the patient, he's already assigned to him, then we have this communication through the CEMC [...] I think that this interaction with the team improved a lot. (DEN2)

The link, communication with the others, there at the top [SMS], with the PSF here, with the center down there, it will further unite the employees. (OHT1)

Other professionals pointed to the contribution of the CEMC for care continuity and for follow-up and prioritization of the highest-risk cases.

Because there in the system we have that episode's discharge, the return, when will the return be, then that thing here for me is care management that we do [...] or then if it was related to mental health, older adult, diabetic, hypertensive, you want to check his pressure all day long, do some control, then everything is here [points to the computer]. (NUR2)

This care management thing is very important because we end up having some follow-up, because when a person comes here and we take care of them and fill in everything, at the end we have to write what you will do with this patient, are you going to discharge that episode or are you going to implement some care measures with him, have some follow-up?[...] then when he returns to the unit, we already know what happened, for continuity [...] (NUR3)

## Use of the CEMC in the Care Management systemic dimension

In this dimension, where formal, periodic and regulated connections are established between the health services, the reports revealed that the CEMC acts a conducting thread that interlinks the various points of the Health Care Networks (HCNs) and allows this movement of the patient through the network to be seen by the professionals from the different care levels.

There you click on the patient, I already see his whole history, if he was in the hospital, which exams he underwent, if he went to the dentist, to the technician, until he reached me. It more than improved. (NUR2)

[...] when the patient goes there to City X, knows that he went through here... goes to City Y... then the patient is monitored, I found it interesting. (NURT3)

## DISCUSSION

The results of the current study indicate that the CEMC allowed the professionals to know the users more in detail, as well as their clinical conditions, family, social context and care history, in addition to the health situations present in the territory where they work. Unlike the printed medical chart, where the notes were unrestricted and not standardized, the CEMC introduced a recording model that requires inclusion of more information about the user, contributing to providing the professional with more qualified and complete data. Consequently, it is inferred that the CECM is realized as a tool that enhances health care planning, as it contributes to a more in-depth understanding of each user's reality and of their care needs.

The Care Management professional dimension is materialized in the encounter between the professionals and the users; therefore, the professional's ability to establish a bond with the patient is one of the main elements of this dimension5. The results indicated that the CECM contributes to establishing this bond, as it helps the health professionals to visualize the territory where they work, the users' health conditions, and the results of the actions developed, both individually and collectively. Such being the case, the CECM instrumentalizes care longitudinality, which is related to continuity of the clinical relationship between professionals and users, through the establishment of a bond and permanent accountability and, over time, monitoring the effects of the health interventions and of other elements in the users' life<sup>13</sup>.

On the other hand, it was identified that the time needed to use the electronic medical chart can exert a negative effect on the professional-patient relationship. In this regard, a number of studies indicate that, during the clinical encounter, the professionals may seem distracted or uninterested, affecting the patient's perception about their communication skills and and the satisfaction with the care provided<sup>14-15</sup>.

Distancing between professionals and patients has been observed and reported by several researchers in recent years. Some studies show that, while using the electronic medical chart, the professionals find it difficult to divide their attention between the patients and the screen; there is interference in eye-to-eye contact, in dialog, in the relationship and in centralizing the attention on the patient<sup>16</sup>.

Interpersonal relationships and information are intertwined as essential health care pillars; consequently, regardless of the changes and of the incorporation of new technologies, the grounds for excellent care will always be communication, understanding each patient's needs<sup>17</sup>. The professional-patient relationship is the core of the Care Management professional dimension; therefore, the professionals cannot overlook it. It is necessary to rethink the use of the CEMC so that it is not an obstacle in building the professional-patient bond.

In the Care Management organizational dimension, the organization of the work process assumes a central place, mainly the definition of care flows and rules, in addition to the adoption of shared devices by the professionals<sup>5</sup>. The results of the second category indicate that the CEMC tools have contributed to organizing the care flow in the system and to the quality of the services provided. In addition to that, organizing the care flow also benefits management of the BHU and planning of the care to be provided.

Care Management in the organizational dimension also depends on several actors' cooperative actions; such being the case, communication between these actors/ professionals becomes fundamental for Care Management effectiveness<sup>5</sup>. This study identified an improvement in communication regarding the team, with implementation of the CEMC. This result is in line with other studies, which highlight the electronic medical record as a work facilitator in the PHC team, as well as a determinant of improvements in communication between the professionals, through better access to the patients'

information<sup>12,18</sup>.

It is also noted that communication among the professionals through the CEMC and access to more qualified information subsidize care continuity. This continuity takes place when care is provided in a complementary manner throughout time, by different professionals, and in a coherent, logic and timely way<sup>19</sup>. Consequently, the CEMC reveals itself as a tool that supports care continuity, mainly in the Information Continuity aspect, as it allows information exchange between different professionals, at different care levels and across the several HCN points of care.

It is in the Care Management systemic dimension that formal and regulated connections are established between the health services, comprising care "networks" or "lines", in order to ensure care comprehensiveness. This dimension consists of services with different complexity levels, interlinked to each other through formal referral and counter-referral processes, resulting in ascending and descending ordered and rationalized user flows<sup>5</sup>. This referral and counter-referral system constitutes a structuring component of the HCNs, so called "logistic system". The logistic system, anchored in Information Technologies, such as the CEMC, ensures rational organization of the flows and counter-flows corresponding to information, products and people, allowing for a dynamic referral and counter-referral process throughout the points of care<sup>20</sup>.

The results indicated that the CECM contributes to strengthening interprofessional communication in BHUs and in other HCN points of care, supporting and monitoring the patient and improving the referral and counter-referral system and the integrality of the care provided to the users. These results are in line with the findings of another study, which identified that establishing an effective communication system that contemplates uniqueness across the health services, involving Primary Care, medium- and high-complexity care in a planned manner, is one of the ways to increase resoluteness of the obstacles involving Care Management in the referral and counter-referral relationships<sup>21</sup>. Thus, the CECM represents and advancement, enabling the practicality and qualification of a referral and counter-referral system, as well as users' access to the SUS gateways.

The current study focused on understanding the use of the Citizen's Electronic Medical Chart and Care Management within the BHUs, and only with the professionals working in them. It is believed that the three dimensions described emerge for that reason, as they involve the professional-patient relationships, the dynamics of the BHU themselves, and their direct relationship with other institutions that comprise the HCN through which the patient circulates. It is considered important to conduct new studies that, in addition to the BHUs, also consider their relationships with the macropolitical context corresponding to implementation of the CEMC.

The study limitations is its generalization capability, given the qualitative character adopted and for having been conducted in two municipalities from the eastern region of MG. Considering the different realities of the Brazilian municipalities and the specificities of PHC, it is pertinent that new studies on this theme be conducted in other Brazilian municipalities and regions.

## FINAL CONSIDERATIONS

In this study, we set out to understand the use of the CEMC for Care Management in Family Health teams. The analysis allowed us to identify use of the CEMC in three of the six Care Management dimensions: professional, organizational, and systemic.

In view of the findings, we conclude that the CEMC represents an advancement in Care Management, as it is realized as a toll that enhances health care planning and

contributes to establishing a bond between professionals and patients, to organizing the citizen' path in the system, to care quality, to improving communication within the team, and to strengthening interprofessional communication in the BHUs and between the HCN points of care.

Consequently, the study contributes to the reflection in the practice on the importance of a perspective that permeates the several Care Management dimensions in the FHS teams' routine, given the introduction of the CECM. Such being the case, the findings of this study may come to guide and support other research studies that deepen understanding of how to use the CECM for Care Management in the FHS teams, and that include the macropolitical context of implementing the CECM, encompassing the six Care Management dimensions.

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Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - Ávila GS, Cavalcante RB, Gontijo TL, Carbogim F da C, Brito MJM; Drafting the work or revising it critically for important intellectual content - Ávila GS, Cavalcante RB, Gontijo TL, Carbogim F da C, Brito MJM. All authors approved the final version of the text.

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