



A multiprofessional information model for Brazilian primary care: Defining a consensus model towards an interoperable electronic health record



Renata Dutra Braga^a, Panel of Specialists in Health^{b,c,d,e,1}, Fábio Nogueira de Lucena^f, Rejane Faria Ribeiro-Rotta^{g,*}

^a Postgraduate Program in Health Sciences, Federal University of Goiás, Goiás, Brazil

^b Federal University of Goiás, (School of Physical Education, School of Nursing, School of Pharmacy, School of Medicine, Program of Music Therapy, School of Nutrition, Program of Psychology, Clinical Hospital), Goiás, Brazil

^c State University of Goiás, (Program of Physiotherapy), Goiás, Brazil

^d Catholic University of Goiás, (Program of Physiotherapy, Program of Psychology), Goiás, Brazil

^e University of São Paulo at Ribeirão Preto (School of Medicine, Occupational Therapy Division), São Paulo, Brazil

^f Institute of Informatics, Federal University of Goiás, Goiás, Brazil

^g School of Dentistry, Federal University of Goiás, Goiás, Brazil

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ABSTRACT

Objective: To develop a multiprofessional information model to be used in the decision-making process in primary care in Brazil.

Methods: This was an observational study with a descriptive and exploratory approach, using action research associated with the Delphi method. A group of 13 health professionals made up a panel of experts that, through individual and group meetings, drew up a preliminary health information records model. The questionnaire used to validate this model included four questions based on a Likert scale. These questions evaluated the completeness and relevance of information on each of the four pillars that composed the model. The changes suggested in each round of evaluation were included when accepted by the majority ($\geq 50\%$). This process was repeated as many times as necessary to obtain the desirable and recommended consensus level ($> 50\%$), and the final version became the consensus model.

Results: Multidisciplinary health training of the panel of experts allowed a consensus model to be obtained based on four categories of health information, called pillars: Data Collection, Diagnosis, Care Plan and Evaluation.

Conclusion: The obtained consensus model was considered valid by the experts and can contribute to the collection and recording of multidisciplinary information in primary care, as well as the identification of relevant concepts for defining electronic health records at this level of complexity in health care.

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1. Introduction

Brazil's Unified Health System (UHS) has no standardisation of health information yet, which leads to great variability in the format of documents and information, there being possibly as many variations as the thousands of health centres distributed throughout the country [1,2]. This variability makes standardisation and commu-

nication between different health professionals difficult. It also has a negative effect on health care as a whole [3]. The development of a model that incorporates a set of essential health information is justified by the need to meet a number of requirements that guide the principles of the UHS [4,5]. These requirements include:

- multidisciplinary care as a comprehensive view of individual health, which is the main source of all information required in different health service settings, as well as in research and health education;
- interaction between the different health professionals working at the primary-care level of complexity; and

* Corresponding author at: School of Dentistry, Federal University of Goiás, Rua C-235, n.1323/1501, 74605-220, Goiânia, Goiás, Brazil.

E-mail address: rejanefrr@gmail.com.

¹ For members of the Panel of Specialists in Health, see the [Appendix A](#)

- (c) preserving the individual's longitudinal record, for better communication between health teams and security of the information that is collected, stored and retrieved, as well as its quality [6,7].

The purpose of this study was to develop a multiprofessional information model to be used in the decision-making process in primary care in Brazil.

2. Background

Brazil's UHS is structured on three levels of health care complexity: primary (gateway to the UHS), secondary (medium complexity) and tertiary (high complexity) [4]. This order of classification does not mean that primary health care has a lower level of complexity than the others since it is also complex, being the principal means of solving the health problems that affect the population most frequently [8]. Primary care should be an initial filter resolving most user health needs, approximately 85% [9], and channelling the demand for more complex services, organising the flow of treatment continuity or treatment at other health care levels [10,11].

It is known that, inevitably, each individual's health information is collected in various care settings and stored in heterogeneous repositories. Integrating this broad set of information is a challenge [12]. According to the last census published in 2011, Brazil has approximately 43,000 basic health units [1]. Establishing effective communication between them, so that data can be interpreted electronically, suggests that information cannot be "isolated" [3], but should be accessible beyond the context that generated it, meaning that service points should share longitudinal health record information. In this way, both the health care professional and the individual seeking assistance will have a full view of the generated health history, respecting ethical and legal issues.

This heterogeneity of care in Brazil, whether in the public, supplementary or private sector, highlights the need to maintain communication at different health care levels. The absence of electronic health records leads to the duplication of documents, tests, prescriptions and medication errors and increases the delay to the right clinical decision-making [1,3]. Furthermore, longitudinal electronic health records can improve the quality and safety of individual care, providing knowledge required to improve health service efficiency [12]. To achieve this, standards for content, structure, representation, security and communication are necessary to develop semantically interoperable technological solutions, some of which are being used in Brazil [13,14].

Considering the need of information availability, the simple standardisation of terminology and tools, for example, is not enough to make an impact on health care quality. Multiple parallel actions need to be undertaken and an important one is the health information storage location (repository) so that it can be analysed or exchanged with other health institutions.

Thus, based on the guidelines and principles of Brazilian UHS [14], which calls for the collectivity and a quality care to the individual, this study is justified as another initiative being undertaken with a view to building an information architecture, centred on the individual and specific for health care at a level of complexity where the largest number of affections in health can be solved.

Studies have been recommending that patient-centeredness should be one of the main concepts to redesign and implement new health technologies in primary care [15]. To reach this goal, a starting point would be the definition of the core set of information that needs to be standardised. Countries that have made large investments in personal health records—PHR (Meaningful Use) have shown that the speed to develop these PHR has gen-

erated a large number of islands, hindering progress to the high level of interoperability [16].

The development of a health record information model through a multidisciplinary collaboration that includes experts in the subject from their different angles, increases the chance of identifying the essential information for this health record [17]. In addition, it addresses the needs of a service with a broader concept of health, instead of that fragmented and centred on each health profession or speciality [3,15].

3. Methods

3.1. Study design

This was an applied observational study, with a descriptive and exploratory approach, using action research with the Delphi method. This approach comprised an investigation in the context of real clinical practice, oriented towards future perspectives [18]. The Delphi method was chosen since it allows a consensual analysis by a group of experts in the research problem and clinical practice. The method comprised three stages: (a) selection the panel of experts, (b) development of the preliminary model and (c) content validation using Delphi method.

3.1.1. Selecting the panel of experts

The panel was composed of faculty and staff who had taught principles of health information collection and/or worked in primary health care (Table 1). These professionals came from four Brazilian institutions of higher education, with a representative from each of the following health professions, officially regulated by Brazil's National Health Council (Physical Education, Nursing, Pharmacy, Physiotherapy, Speech Therapy, Medicine, Nutrition, Dentistry, Psychology, Occupational Therapy), one health profession unregulated (Music Therapy) and Computer Science. The following inclusion criteria were considered:

- (a) Health professionals, formally recognised in their speciality;
- (b) Health professionals with experience (clinical practice, teaching or research) in symptomatology and/or primary care;
- (c) Professionals in the area of computing with experience in health informatics.

The snowball technique was also adopted to select experts in some health professions. This technique takes suggestions from the already-included experts for new participants who were not previously considered [19].

3.1.2. Development of preliminary health information record model

To develop the preliminary model, the expert panel received no initial proposal. The professionals were explained about the purpose of the desired information model, based on four main factors: focus (individual), scope (primary care), information type (the common health information needed among the different health professions) and the guiding questions of the study.

The essential information of the general health of an individual were identified by panel members, through discussions (brainstorm) performed in a sequence of collective and individual regular meetings.

At the end, the result was a mind map, which contained all the essential information identified and their connections. These informations were grouped according to their similar characteristics in four sets called pillars: Data Collection, Diagnosis, Management, Therapy and Assessment. The preliminary model was then used to search the Delphi consensus.

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