

Teledentistry: Permanent distance learning

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Abstract

This article describes the implementation of the Teledentistry Project until the second semester of 2008. The project offers e-learning to several dental health professionals working in the Belo Horizonte city Department of health. The project resulted from a demand by the local health authority of the municipality of Belo Horizonte, the Belo Horizonte City Department of Health – SMSA/BH. The intention was to create a partnership with the School of Dentistry at the Federal University of Minas Gerais. By establishing a virtual interaction between public dental health authorities and the university. The project aims: (1) To supply ongoing (permanent) education to the team that delivers dental health public service to the citizens; (2) to gather relevant information among the service suppliers that will subsidize the discussion about professional education in the sector; (3) To test and improve the virtual learning methods in the sector; (4) to consolidate the concept of team work among the service suppliers. The results indicate that the project has been well accepted.

Key words: Oral Health; Dental Health Services; Dental Education, Continuing Education; Education at a Distance; Videoconferencing; Teledentistry.

Teleodontología: educación permanente a distancia

Este artículo describe las acciones desarrolladas hasta el segundo semestre del año 2008 del proyecto “Teleodontología” que forma parte del Programa BHTelessaúde. Es una experiencia de educación a distancia mediada por videoconferencia, ofrecida a los miembros del equipo de salud bucal que actúan en la Secretaría Municipal de Salud de la ciudad de Belo Horizonte. La alianza con la Facultad de Odontología de la Universidad Federal de Minas Gerais surgió de la demanda de la Secretaría Municipal de Salud de la Municipalidad de Belo Horizonte. La alianza establece un camino virtual de interacción entre los profesionales de salud bucal de la red pública y de la universidad con el objetivo de: (1) proveer educación permanente al equipo de salud bucal que compone la red pública; (2) captar subsidios junto a la red para discutir la formación de los profesionales de odontología según las nuevas directrices curriculares, (3) experimentar la construcción del conocimiento por medio virtual de enseñanza/aprendizaje y (4) sedimentar el concepto de trabajo en equipo. Los resultados señalaron avances en la propuesta de construcción colectiva y una excelente aceptación de los profesionales del servicio en relación al proyecto.

Palabras clave: Salud Bucal; Servicios de Salud Dental; Educación Continuada em Odontología; Educación à Distância; Videoconferencia; Teleodontología.

Telessaude bucal: educação permanente a distância

Este artigo descreve as ações desenvolvidas até o segundo semestre do ano de 2008 do projeto “Telessaúde Bucal” que faz parte do Programa BHTelessaúde. É uma experiência de educação a distância mediada por videoconferência, ofertada aos membros da equipe de saúde bucal que atuam na Secretaria Municipal de Saúde de Belo Horizonte. A parceria com a Faculdade de Odontologia da Universidade Federal de Minas Gerais surgiu da demanda da Secretaria Municipal de Saúde. A parceria estabelece um caminho virtual de interação entre os profissionais de saúde bucal da rede pública e da universidade objetivando: (1) fornecer educação permanente à equipe de saúde bucal que compõe a rede pública; (2) captar junto à rede subsídios para discutir a formação dos profissionais de odontologia segundo as novas diretrizes curriculares, (3) experimentar a construção do conhecimento por meio virtual de ensino/aprendizagem e (4) sedimentar o conceito de trabalho em equipe. Os resultados apontaram para avanços na proposta de construção coletiva e uma ótima aceitação dos profissionais do serviço em relação ao projeto.

Palavras-chave: Saúde Bucal; Serviços de Saúde Bucal; Educação Continuada em Odontologia; Educação a Distância; Videoconferência; Teleodontologia.

Resumen

Resumo

INTRODUCTION

The “Teledentistry” project is registered at the School of Dentistry at the Federal University of Minas Gerais (FO/UFMG) as both an extension project and part of a program that seeks to introduce information technology in the Belo Horizonte Department of Health denominated BHTelehealth.¹ This project originated from a request of the Belo Horizonte City Department of Health (SMSA/PBH), which sought to establish a partnership with FO/UFMG. The program was implemented in 2004 with the purpose of developing permanent education and providing assistance to the Brazilian Public Health System (SUS) specialists. It was initially financed by the European Community through the @LIS Project (Alliance for the European Information Society Europe/Latin America) and the Brazilian Ministry of Health. The approach to dental health was incorporated in 2005. The Belo Horizonte city department of health has nine Sanitary Districts with a total of 146 Primary Care Units (UBS) of which 139 have dental health services. The BHTelehealth network was established in all of the Primary Care Units of the Sanitary Districts in 152 health care units (Primary Care Units and Secondary Care Units) and an additional eight establishments.^{1,2}

The field of Dentistry is facing a period of accelerated change in terms of concepts and paradigms. As a result, this generates a great need for qualifications update on the part of specialists.³ “Teledentistry” creates a partnership that is capable of establishing an experience of permanent distance learning by means of a virtual path of mutual interest between specialists in dental health services and specialists in dentistry education at FO/UFMG.

For some time now, what is being taught in universities to those students seeking placement in the health areas is quite removed from the needs of the majority of the population.⁴ In 1996, the Ministry of Education⁵ published guidelines to regulate the Law of Guidelines and Educational Base (LDB). The law sought to change teaching methods so that it would now encompass an approach that recognized the university's obligation to society. In this sense, once students graduate and enter the job market, they would be better apt to recognize certain problems and to change the reality. In 2001, while researching the effectiveness of promoting dental health in an Integrated Dental Healthcare Teaching Clinic Almeida and Padilha⁶ concluded that the actions developed in this sense and in such an environment were not capable of producing an impact on the dental health of that population. In 2002, the Ministry of Education and Culture⁷ recommended that entry-level specialists should be concerned about the quality

and equity of services and should have a comprehensive, humanistic approach to their profession. These privileges should make these professional more capable of acting in all levels of health service. In turn, their actions would reflect their understanding of the social and economic reality which they are a part of the environment in which they find themselves.⁷ Until the change recommended by the Ministry of Education and Culture, the model for dental education focused on individual dental practice and placed emphasis on the perfection of highly technical areas.⁸ Curative dentistry is what has inspired the courses taught in universities, being that teaching is not directed by the present situation of the population and not even by epidemiological, social or economic terms. There is a real need to seek true and inclusive solutions for the dental health of the population.⁹ The performance required of the present curriculum guidelines imposes the need for a review of the content in both curative and preventative terms. Thus, it is for that purpose that the university has to be aware of the priorities of social demands and be capable of producing directed, relevant knowledge.¹⁰ Nonetheless, most of the universities are far removed from the real needs of the population and consequently reproduce realities in the classrooms, laboratories and day clinics that are far removed from those the country reflects.¹¹ It has become clear that there is a need for curriculum reform that seeks to change the reality of teaching and to contribute to the country's transformation.

While restructuring of university curricula occurs at different paces in order to change the profile of new students, other solutions for rethinking and changing the knowledge acquired by students, who are graduating or have graduated, should be sought. In this sense, given the explosive rate of development of the Internet, it seems appropriate to use electronic exchange and transfer of information.¹²

The possibility of experimenting with information and communication technology's evolution in the process of teaching/learning is another relevant aspect of this project. In experiments with videoconferencing, while recognizing the technical difficulties and adaptation of human resources, the evaluation on the part of teachers and students has been positive.^{13,14} Considering the dimensions of Brazil and the number of people who need their qualifications updated, distance learning at the undergraduate, graduate and extension levels can be regarded as an important solution for each of these levels with different educational objectives.¹⁵ UNESCO¹⁶ in its bulletin on teaching, notes that virtual learning constitutes a form of educational technology, which offers several opportunities to teaching institutions all over the world. In addition, it de-

fines virtual teaching as an interactive informational program of a pedagogical nature that possesses the capability of integrated communication. The globalized world forces contemporary societies to adopt a new posture in light of the speed of technological advances and the consequent discrepancies in knowledge. In this scenario, distance learning appears as a recommended and feasible alternative with the practice of videoconferences regarded as its most promising format.¹⁷

In municipal health services, the proposal of distance learning occurs in an extremely rich historical context. The first Family Health Teams (ESF) in Belo Horizonte were implanted in February, 2002. At the beginning of the implantation, the SMSA used existing human resources in the network to format the ESF. For that purpose, they developed a methodology of recruiting these specialists into the Family Health Program (PSF). Thus, the first ESF registered were set up with network specialists. Preparing these professionals to work in a different logic, geared towards assistance, was and continues to be a great challenge.

As of 2003, there was an accelerated process of implantation of new ESF teams in Belo Horizonte. After this movement, it was necessary to make new efforts in identifying gaps and problems related to the city's assistance model. The city's Primary Care Units were reorganized to provide unrestricted services to the population. The process of establishing the Family Health Teams in the municipality brought along several advances. As a result, there was an increase in human resources, a reorganization of the work process, and a change in the manner people were approached. A variety of services were now provided in health care with the establishment of several new activities in the Primary Care Units. An integrated user approach was encouraged. Access to health care services increased particularly to the adult population. Primary care was considered the entrance to the system, even if it was not the only entrance it was the main one. A population, once invisible and dependent on care in their homes, was now identified at the Primary Care Units. In addition, there was an enormous expansion of assistance provided at homes by diverse ESF specialists.^{1,2}

It is in this context that the opportunity for starting videoconferences in dental health arises. By doing so, it favors the improvement not only with regard to professional qualifications but also to the services provided. Based on these perspectives, the proposal was to create a virtual space for learning, where the experiences of specialists in dental health, from the basic network of SUS BH, could be shared according to modern scientific knowledge.

Hence, this article intends to describe the experience of this project from the point of view of the group conducting the process.

METHODOLOGY

The "Teledentistry" project is based on the use of virtual communication tools through interconnection of the information network of the Belo Horizonte City Department of Health in partnership with the Federal University of Minas Gerais (UFMG). Sametime software was adopted which employs multipoint videoconferencing by using image, data and voice resources. With regard to hardware, a model consisting of a microcomputer, equipped with a multimedia kit and webcam, was chosen. A workstation was created at SMSA/PBH and another at FO/UFMG.

Initially, the themes addressed considered three paths: (1) one composed of network specialists, for solving assistance problems or everyday difficulties; (2) one set at the University, dealing with the dissemination of new knowledge and/or changes to preconceived knowledge; (3) one set in the municipal department with regard to its needs to change health care practices.

Over the semesters, the themes were chosen according to the following demands:

- 2nd semester 2005: the themes were chosen given the specific demands placed by the specialists and professionals, working in the SUS BH network, during the first videoconference.
- 1st semester 2006: the themes were chosen by SMSA BH and UFMG.
- 2nd semester 2006: a choice/hierarchy of themes was offered to specialists of the network based on previously offered themes.
- 1st semester 2007: some specialists of the network signed up to present practical work. In the second part of the videoconference, UFMG teachers team developed the theme in more detail.
- 2nd semester 2007: themes were chosen based on a selection from the best papers that were presented in the II Seminar of Basic Healthcare of SMSA BH. Later in the videoconference, UFMG teachers team developed the themes in more detail.
- 1st semester 2008: themes were chosen based on a selection from the papers that were presented in the districts and indicated for the videoconference.
- 2nd semester 2008: themes were chosen based on a choice/vote made by specialists of the SUS BH network, online.
- 1st semester 2009: themes were filtered from the first choice /vote made by specialists of the SUS BH network, online.

The videoconference occurred online with a predetermined date, with a set theme and for a specific duration of time. The presenters are selected among FO/UFMG teachers team according to their area of specialization. Presenters also received a certificate for participating by the FO/UFMG Extension Center. The videoconferences generally occur once a month and last for approximately an hour and a half. The themes are presented for about 60 minutes, being that 30 minutes is taken up to discuss the experiences of network specialists and the remaining 30 minutes is taken up by UFMG teachers team to reflect and elaborate on certain theoretical issues. The rest of the time is used for online question and answer. After each videoconference, didactic material is made available for all the specialists of the public network in a specific forum established by the city government, which is also used to communicate information. Managers or any specialist of a Primary Care Units can access this material through the internal network. At the end of each videoconference, online lists for presence and participation are required of the service specialists.

RESULTS AND DISCUSSION

Table 1 refers to the videoconferences held from September 2005 through December 2008. Figure 1 also presents the themes, dates, number of participants and total units connected.

In Belo Horizonte, access to the videoconferences did not occur all at once, since they were gradually introduced.

In the first semester of 2006, the number of Primary Care Units with capacity to connect to the videoconferences increased 2.7 times compared to the second semester of 2005. In March, there were 21 network Primary Care Units. In July, there were 57 Primary Care Units in the network. This explains the large increase of specialists accessing the videoconferences that year. In the same period, in addition to the increase in the number of Primary Care Units of the network, the number of people watching the videoconferences also increased considerably.

This result points to an expansion in the coverage to the extent that the incorporation of new connections increased. It can also be noted that other people, who worked in health care but were not members of the dental health teams, expressed an initial curiosity in the program. These people belonged to other professions (doctors, nurses, health technicians and health center managers). The results also show that there is acceptance for the proposal of permanent distance learning

education. Informally, there were quite positive evaluations of the program with regard to its content and relevance.

Currently, all of the Primary Care Units in Belo Horizonte have computers and access to videoconferences. Nevertheless, the videoconference in dental health that had the best connectivity involved more than 50% of the city's Primary Care Units.

Several factors may be responsible for this. After the evaluation and discussion of the results among the health center managers, some problems were found. Some of these include: difficulty to access the system, insufficient disclosure of the videoconference schedules, indifference or lack of interest on the part of some professionals with regard to the project, momentary impossibility of access in the physical space where the system is installed, appearance of dental emergencies at the moment of the videoconference, lack of planning, absenteeism and other unforeseen happenings independent of the specialists will. In addition to the items listed, the evaluations confirm that the managerial direction, which enables specialists to access the system of scheduled dates and times, is the most important factor necessary to face when considering the difficulties of access.

Table 1 presents the increase in the number of participants specialists in graphic terms in videoconferences and the total of units connected from 2005 to 2008.

In 2008, analyzing the participation of specialists in videoconferences (Figure 2), we noted that although there was an intention for developing directed educational action to the entire dental health team (Dental Surgeon, Dental Hygiene Technician and Dental Office Assistant), the greatest participation was among Dental Surgeons.

For the purpose of stimulating greater participation of specialists on a technical level (DOT and DHT) in the evaluation videoconferences and surveys of new items, it seems important to include themes that may be of greater interest to these specialist categories. For the year 2009, these themes are established in the first semester's schedule.

Next year, indicators are intended to be applied to participation forms or to specific questionnaires for the purpose of having a more objective evaluation of the project's effectiveness.

This Project certainly presents itself as an important step towards assuring a permanent communication channel with the SUS BH network and former undergraduates. This communication is important given the fact these graduates did not have the same educational training established by the new curriculum guidelines. Therefore,

Table 1 - List of themes in the videoconferences, dates held, total of participants and units connected. Belo Horizonte, 2008.

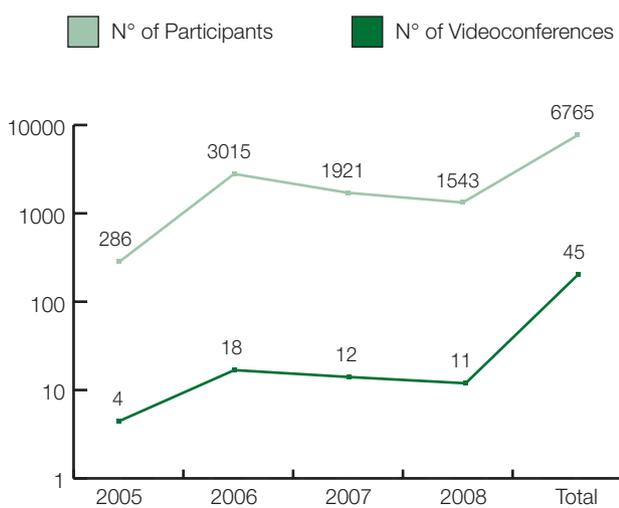
Theme	Date	N. of Participants	Units Connected
First videoconference in dental health: approach to themes	22/09/05	74	16
Primary care in periodontology	26/10/05	86	15
Importance of basic procedures in periodontology	30/11/05	70	15
Hepatitis B and C and the practice of dentistry	07/12/05	56	15
New concepts in health education	08/03/06	78	9
Control of intra-dental infection: ART as strategy	15/03/06	90	9
Estomatological evaluation in elderly patients	29/03/06	143	16
Oral / Mouth cancer	05/04/06	188	33
Pulpotomy in one session	10/05/06	192	42
Care in hypertensive patients	24/05/06	210	43
Care in dentistry patients in chemotherapy treatment	14/06/06	190	40
Prescription of medication by the dental surgeon	05/07/06	193	43
Themes for the 2nd semester 2006 teleconference	02/08/06	116	26
Urgencies in dental health in the SUS BH network	16/08/06	140	31
How to deal with main emergency situations	30/08/06	235	52
Assistance to HIV/AIDS patients	13/09/06	167	47
Control of cross infections	27/09/06	268	54
Attention to children from zero to seven years of age	11/10/06	180	44
Cavity diagnostics	25/10/06	182	54
Composite resins	08/11/06	200	50
Update of composite resins	22/11/06	177	45
Survey of 1st 2007 semester themes	20/12/06	66	28
Healthcare to special needs users	28/02/07	157	53
Specialized attention in dental health in SUS BH	28/03/07	153	52
Services in the Tirol HC: a new way of having access to dental health	25/04/07	172	50
Integrated actions in dental health in primary units	23/05/07	186	60
Insertion of dental health in the regulatory system – SISREG	13/06/07	166	58
Restructuring of Access to dental health in the HC	20/06/07	199	71
Dental services to bedridden patients at the S. Gabriel P.C.U	04/07/07	134	51
Regulation of consultations in endodontology: preparation of intra canal	22/08/07	141	73
Update of dental materials	26/09/07	206	72
Atypical plastic restorations	17/10/07	134	47
Surgical complications in primary care	14/11/07	137	44
Sterilization centers and instrument processing	12/12/07	136	58
Services to the bed-ridden and the caretaker – S. Gabriel P.C.U	20/02/08	89	44
Periodontal treatment in primary care	19/03/08	117	41
Dental health attention: how to do it. São Paulo P.C.U	23/04/08	94	29
Therapeutic conduct in pediatric dentistry	21/05/08	110	37
Relationships with schools/promotion of dental health – Cachoeirinha P.C.U	18/06/08	175	56
Complications in exodontology in primary care	16/07/08	68	29

continues...

Table 2 - List of themes in the videoconferences, dates held, total of participants and units connected. Belo Horizonte, 2008.

Theme	Date	N. of Participants	Units Connected
Update in pharmacology	13/08/08	134	45
Individual and collective care in elderly health service	10/09/08	168	57
Care in cardiology applied to dental health	08/10/08	197	72
Approach to dental health in operative groups	12/11/08	211	65
Organization of the local work process: the agenda	10/12/08	134	45
Evaluation and surveying of new themes	17/12/08	114	44

Source: SMSA BH



Dental Telehealth	2005	2006	2007	2008	Total
N° of videoconferences	4	18	12	11	45
N° of participants	286	3015	1921	1543	6765

Figure 1 - Variation of the number and total participants in dental health videoconferences between years 2005 and 2008. Belo Horizonte, 2008. Source: SMSA BH

these are the graduates who need to reconsider and update their qualifications. Permanent distance learning certainly has a practical advantage which is that of coverage, given that it does not require a large physical space or an extensive infrastructure. In these settings, virtual meetings can gather a large number of beneficiaries with a simple logistic which also does not require that professionals leave their work environment.

As the videoconferences contemplate the entire dental health team, another important aspect of the process is the appreciation and professionalization of all the dentistry specialists and not just the dental surgeon. This is a result of the fact that operations in dental health have become a

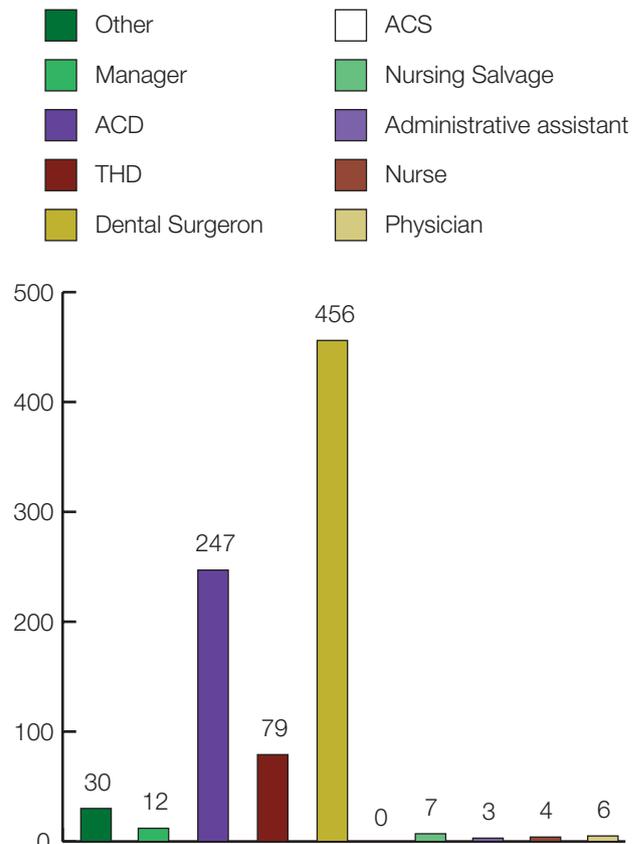


Figure 2 - Videoconference distribution by professionals in the second semestre of 2008, Belo Horizonte, 2008.

joint team effort which calls for the presence of new actors and protocols, mainly those pertaining to bio-security.

Since the last curricular change, the FO/UFMG has taken on the responsibility of training dental surgeons so that they are apt to act and coordinate this team practice.¹⁸ "Teledentistry" cooperates with this process so it becomes a reality in the workplace, since it offers the same foundation of knowledge to all the members of the team. As a result, all participants can work together and in the same direction.

Dialogue is established among a group of people concerned with solving real problems that occur on the job. In addition, they are concerned with the review and update of scientific knowledge as they recognize the importance of experimenting and evaluating new teaching methods. In this sense, health professionals can update their knowledge without the discomfort of having to leave their workplace. This process also strengthens the notion of teamwork.

CONCLUSION

The Permanent Distance Learning Project, mediated by videoconference, presented itself as a contribution that was well accepted by the dental health team in public service. One can also claim that it is an effective means of reaching the university's goal with regard to renovating and improving the scientific foundations established in undergraduate studies. This is done through a realistic focus on the challenging questions related to the social context.

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