Creation and Expansion of a Virtual COVID-19 Information Exchange Platform Using the Brazilian University Telemedicine Network (RUTE)

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ABSTRACT

Introduction: Due to Brazil's alarming situation, Brazilian professionals decided to create a Special Interest Group about coronavirus disease-2019 (SIG COVID-19 Brazil RUTE—the Brazilian University Telemedicine Network) with the objective of promoting training sessions by web conference for professional and medical students.

Aim and objective: To describe the experience of rapidly organizing this professional network based on telemedicine activity and share its initial results.

Materials and methods: The structure adopted was MConf, a web conference platform that provides a virtual conference channel for 75 active participants and online video streaming for an additional unlimited number of attendees. The agenda started with meetings occurring 3 times a week, which were changed to weekly encounters in July, and are scheduled to be monthly in August. The interactive presentations lasted 30–40 minutes, with approximately 20 minutes for written or spoken debate. After each presentation, all participants were invited to register their presence and answer brief evaluation questions about the quality of the presentation, with an evaluation score ranging from 1 (poor) to 10 (excellent).

Results: From March 23 to June 30, 2020, forty-one web conferences were presented in the areas of epidemiology, medicine (different specialties), nursing, physiotherapy, dentistry, and new technologies, with the participation of 52 speakers from 12 Brazilian states and 12 international guest speakers from 9 countries: Israel, Italy, United States of America, Spain, Switzerland, Portugal, Canada, Ecuador, and Qatar. The program had in its coverage 2,170 registrations by 857 participants from 135 distinct institutions. The conference's attendance average reached up to 100 participants. Around 60% of the attendees answered the program's quality survey; the average evaluation score for quality of transmission, professional contribution; and topic relevance were 9.0, 9.5, and 10, respectively.

Conclusion: The experience of working with telemedicine was determinant to create the innovative SIG COVID-19 Brazil RUTE, providing an important learning experience on diagnosis, treatments, and outcomes for the COVID-19 crisis management.

Keywords: COVID-19, Distance learning, Medical education, Pandemy, Telemedicine, Web conferences.

RESUMO

Introdução: Devido à situação alarmante causada pela chegada do COVID-19 no país, profissionais brasileiros ligados à Rede Universitária de Telemedicina (RUTE) decidiram criar um Grupo de Interesse Especial sobre o COVID-19 (SIG COVID-19 Brasil RUTE), para promover sessões de treinamento para profissionais da área da saúde e estudantes.

Objetivo: Apresentar a experiência de organizar rapidamente essa rede profissional, com base em uma atividade de Telemedicina, e compartilhar seus resultados iniciais.

Materiais e métodos: A estrutura adotada foi o MConf, uma plataforma de webconferência que permite 75 participações simultâneas e uma conexão adicional por streaming com número ilimitado de participantes. A agenda começou com reuniões três vezes por semana, que passaram ao regime semanal em julho e mensal em agosto. As apresentações interativas tiveram duração de 30 a 40 minutos, com aproximadamente 20 minutos para debate. Após cada apresentação, todos os participantes foram convidados a registrar a presença e responderem a breves perguntas de avaliação sobre a qualidade da apresentação, com uma pontuação de avaliação variando de 1 (ruim) a 10 (excelente).

Resultados: De 23 de março a 30 de junho, foram realizadas 41 webconferências nas áreas de epidemiologia, medicina (diferentes especialidades), enfermagem, fisioterapia, odontologia e novas tecnologias, com a participação de 52 oradores de 12 estados brasileiros e 12 oradores internacionais de 9 países: Israel, Itália, Estados Unidos da América, Espanha, Suíça, Portugal, Canadá, Equador e Catar. Esse programa teve mais de 1.500 participantes, e a presença diária nas conferências atingiu 100 participantes, em média. Cerca de 60% dos participantes avaliaram a qualidade do programa e, a pontuação média de avaliação de qualidade de transmissão, contribuição profissional, relevância do tópico foram, respectivamente, 9,0, 9,5 e 10.

Conclusão: A experiência de trabalhar com Telemedicina foi determinante para criar o inovador SIG COVID-19 Brasil RUTE, fornecendo importante experiência de aprendizado em diagnóstico, tratamentos e resultados para o gerenciamento de crises do COVID-19.

Palavras-chave: COVID-19, Pandemia, Telemedicina, educação a distância, ensino médico, webconferencia.

Panamerican Journal of Trauma, Critical Care & Emergency Surgery (2020): 10.5005/jp-journals-10030-1291

INTRODUCTION

Throughout the beginning of 2020, the scientific global community has been challenged by the new coronavirus disease-2019 (COVID-19) pandemic, characterized as a major threat to public health worldwide. It is a highly contagious disease, with clinical and major respiratory and systemic manifestations including dry cough, fever, and fatigue, and it has also been frequently associated with pulmonary involvement.^{1,2} In early February, the World Health Organization (WHO) published its first document regarding strategic preparedness and response to the COVID-19 outbreak, with the aim of guiding countries with overcrowded health systems. Nearly 40 days later, the disease was categorized by the WHO as a pandemic.³ The first case was confirmed in Brazil on February 21, 2020.⁴

Based on the daily data made available by the WHO as well as Brazilian regional diseases reports, it has been possible to track COVID-19 spread and lethality.^{5,6} The urgent need for training and building the capacity of multiple essential health professionals has been fundamental for changing public policies, since COVID-19 mortality reached 58,314 deaths on June 30.⁷

Due to the country's alarming situation, allied to its social diversities and territorial extension, some professionals from different Brazilian states, most of them members of the Brazilian Telemedicine University Network (RUTE),⁸ created the Special Interest Group (SIG) about COVID-19 (SIG COVID-19 Brazil RUTE).⁹ The main objective of the SIGs is to promote training sessions by web conference, lectures, debates, protocol discussions, and research in various health areas and medical specialties for professionals and medical students at varied levels of experience.

The increasing development of technology has provided the ability to revolutionize different aspects of communication and reduce physical distances through real-time virtual interactions. These are the principles of telemedicine, whose objective is bringing together multiple universities and hospitals, with different pandemic assistance stages and procedures.¹⁰ It mainly provides an essential information exchange between professionals from Brazil and those from other countries.

The objectives of this study were to describe the experience of rapidly organizing a telemedicine-based professional network to share information regarding the COVID-19 pandemic through an RUTE's collaborative teleconference platform.

MATERIALS AND METHODS

The RUTE Network was launched in 2006, and now it covers 139 telemedicine units in medical schools and teaching hospitals across all Brazilian states. The RUTE has 55 on-going Special Interest Groups (SIGs) that hold scientific video conference sessions, engaging 380 different health institutions. RUTE participating institutions are free to propose, create, and coordinate SIGs covering medical and health sciences topics, operating under RUTE's infrastructure.^{8,11} Any health institution or even basic units are able to participate in the SIGs sessions. On March 20th, 2020, the RUTE coordinator (LAM, from Vila Velha, ES) and three professors (GPF, from University of Campinas, SP; EE, from University of the State of Rio de Janeiro, RJ; and CK, from Federal University of Health Sciences of Porto Alegre, RS), who had never met before but had experience in participating in other SIGs in their specialties, joined a advisory conference with the mission of creating the denominated SIG COVID-19 Brazil RUTE. Other professionals, RUTE staff, and medical students were

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How to cite this article: Fraga FA, Eisenstein E, Messina LA, *et al.* Creation and Expansion of a Virtual COVID-19 Information Exchange Platform Using the Brazilian University Telemedicine Network (RUTE). *Panam J Trauma Crit Care Emerg Surg* 2020;9(3):189–194.

Source of support: Nil

Conflict of interest: None

invited for the first online meeting to discuss the organization and planning of activities, and a WhatsApp® group (WhatsApp Inc.) with 16 members, from 10 different cities in Brazil, was created as an Organizing Committee to share information between members.^{12,13}

The structure adopted was a web conference platform, MConf, initially developed under a working research group at National Research and Education Network (RNP) and now an RNP Service, which provides a virtual conference channel for 75 active participants and online video streaming for an additional unlimited number of attendees.^{14,15} The schedule was defined as 60 minutes meetings on every Monday, Wednesday, and Friday during lunchtime, with multidisciplinary topics. The conferences started on March 23rd, when the pandemic was at its beginning in Brazil. National and international speakers were invited to share their experience as well. These conferences changed to weekly occurrences in July, and the goal is keep once a week until the end of the pandemic. All web conferences are public, online, and with no costs for participation or presentation.

For each conference, an electronic flyer (Fig. 1) has been sent by e-mail to members of RUTE and via WhatsApp to different groups in the health area to facilitate rapid interest, with the support of some medical societies.

Each presentation occurred for 30–40 minutes, with approximately 20 minutes for questions and answers via spoken or written chat. All presentations were recorded and most of them, according to the presenters' authorization, are saved and available at <http://wiki.rnp.br/display/RUTESIGCOVID19>, allowing access by those interested in any topic at different times.

The Organizing Committee worked as a team to have a balance between the diverse interests and topics conforming to the evolution of the pandemic. After each presentation, all participants were invited to register their presence through a QR code, identify the city where live, and answer brief structured evaluation questions about the quality of transmission, professional contribution, and topic relevance. The answers were tabulated and analyzed with

an evaluation score ranging from 1 (poor) to 10 (excellent), using Microsoft Excel®. Only participants who answered the complete questionnaire were included.

The study obtained approval from RUTE Network review board.

RESULTS

From March 23rd to June 30th, a total of 41 web conferences were presented in the areas of epidemiology, medicine (different

specialties), nursing, physiotherapy, dentistry and new technologies, with the participation of 52 speakers from 12 Brazilian states and 12 international guest speakers from 9 countries: Israel, Italy, United States of America, Spain, Switzerland, Portugal, Canada, Ecuador, and Qatar. Table 1 shows the agenda with topics and speakers.

Therefore, with speakers from over a third of Brazilian states, the program had 2,170 registrations, by 857 participants from 135 distinct institutions. The conference's attendance at each session ranged from 48 to 150 participants, with a mean of 100, including streaming media. The attendee confirmation (Fig. 2) was filled for 857 participants who answered the questionnaire, which corresponded to approximately 60% of the audience at web conference platform during each session.

Based on the 802 complete answers received on the program's quality survey, the average evaluation score for quality of transmission, professional contribution, and topic relevance were 9.0, 9.5, and 10, respectively.

The participants were from 52 cities, from every Brazilian state (26 in total) and the Federal District of Brasília, as shown at Figure 3.

DISCUSSION

The use of telemedicine has transformed the access and dissemination of information, especially when it comes to a global challenge to overcome a pandemic never seen in modern times.^{16,17} The possibility to connect different regions of the globe through teleconferences represents an opportunity to acknowledge the

Fig. 1: Poster template for publicizing conferences

Table 1: SIG COVID-19 Brazil RUTE agenda with topics covered until June and speakers

Date	Topics	Speakers	City, state or country
March 23rd	Inaugural meeting of SIG COVID-19 Brasil RUTE	Luiz Ary Messina Gustavo P. Fraga Evelyn Eisenstein Cristiane Kopacek	Vila Velha, ES, BR Campinas, SP, BR Rio de Janeiro, RJ, BR Porto Alegre, RS, BR
March 25th	Report on actions to combat COVID-19: Hospital Israelita Albert Einstein and The Israel Center for Disaster Medicine and Humanitarian Response	Milton Steinman Elhanan Bar-On	São Paulo, SP, BR Tel-Aviv, Israel
March 27th	Personal protection equipment	Cristhieni Rodrigues Mariana Meszaros	São Paulo, SP, BR Campinas, SP, BR
March 30th	Covid-19: a great collective challenge—the Italian experience	Fabiane Barbosa	Milan, Italy
April 1st	Clinical—radiological correlation during COVID-19 pandemic	Rafael Grando	Porto Alegre, RS, BR
April 3rd	Telemedicine outreach during the COVID-19 pandemic	Antonio Marttos Jr.	Miami, USA
April 6th	COVID-19 emergency care in aid to the flow of patients at HC—Unicamp	Ricardo Affonso Ferreira Gustavo P. Fraga	Campinas, SP, BR Campinas, SP, BR
April 8th	Appropriate COVID-19 testing for diagnoses	Marilda Siqueira Marilda de Lourdes Oliveira	Rio de Janeiro, RJ, BR Rio de Janeiro, RJ, BR Oliveira
April 13th	Clinical aspects—COVID-19	Albert Levy	New York, USA
April 15th	COVID-19: impressions from Spain experience	Tiago Jeronimo	Madrid, Spain
April 17th	Evolution of the COVID-19 pandemic at Amazonas	Bernardino Albuquerque Pedro Elias	Manaus, AM, BR Manaus, AM, BR
April 22nd	Clinical aspects of COVID-19 in children and adolescents	Luis Carlos Rey Tiago Henrique Souza	Fortaleza, CE, BR Campinas, SP, BR
April 24th	INCOR's experience in the TeleUTI COVID-19 network	Marco A. Gutierrez	São Paulo, SP, BR

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<i>Date</i>	<i>Topics</i>	<i>Speakers</i>	<i>City, state or country</i>
April 27th	The challenges of oncology during COVID-19 times	Alice Zelmanowicz Rafaela K. Dal Molin Stephanie Shahini Herb Riband	Porto Alegre, RS, BR Porto Alegre, RS, BR Porto Alegre, RS, BR Geneva, Switzerland
April 29th	Coagulopathy and thromboprophylaxis in COVID-19	Erich de Paula	Campinas, SP, BR
April 30th	Orienta + COVID-19: action of undergraduate students in the health system	David Cirigussi João Felipe Fernanda Cristina	Campinas, SP, BR Campinas, SP, BR Campinas, SP, BR
May 4th	Diagnosis, monitoring and treatment in televideo consultation to the patient affected with COVID-19	Nando Campanella	Ancona, Italy
May 6th	Actions of the Pedro Ernesto University Hospital in facing the pandemic of the new COVID-19 virus	Ronaldo Damião	Rio de Janeiro, RJ, BR
May 8th	Challenges of immunoglobulins and cytokines vs. viral epidemics/ COVID-19	Mario Geller	Rio de Janeiro, RJ, BR
May 11th	COVID-19 and pediatric endocrinology: what we need to know	Cresio Alves	Salvador, BA, BR
May 13th	Updates on COVID-19 treatment	Otávio Berwanger	São Paulo, SP, BR
May 15th	The experience of Hospital São Paulo and Hospital das Clínicas of FMUSP with hospital dentistry in times of COVID-19	Denise Abranches Juliana Franco	São Paulo, SP, BR São Paulo, SP, BR
May 18th	Mechanical Ventilation of COVID-19 patient	Jorge Luis Valiatti Antônio L. E. Falcão	Catanduva, SP, BR Campinas, SP, BR
May 20th	Evolution curves of COVID-19 in Brazil and in the world: dispelling some myths.	Mauro Pontes	Porto Alegre, RS, BR
May 22nd	The panorama of health in Recife in the face of COVID-19	Jailson Correia	Recife, PE, BR
May 25th	EBSERH's effort to mobilize and confront COVID-19	Giuseppe C. Gatto	Brasília, DF, BR
May 27th	Manaus Mission—Experience at the Epicenter of COVID-19	Luciano S. Eifler	Porto Alegre, RS, BR
May 29th	Intubation in a patient with COVID-19	Guilherme Haelvoet Maurício Malito	São Paulo, SP, BR São Paulo, SP, BR
June 1st	Epidemiology of COVID-19 in Brazil—Epicovid 19	Pedro Hallal	Pelotas, RS, BR
June 3rd	Vulnerability indicators for COVID-19 in indigenous people	Claudia Codeço Marta Azevedo	Rio de Janeiro, RJ, BR Campinas, SP, BR
June 5th	Challenges of neonatal screening in times of COVID19: experience of RS and SP (SIG RUTE CONVID19-BR)	Giselle Yuri Hayashi Marcia Maria C. G. Giusti Simone M. de Castro Cristiane Kopacek Ana Maria Martins	São Paulo, SP, BR São Paulo, SP, BR Porto Alegre, RS, BR Porto Alegre, RS, BR São Paulo, SP, BR
June 8th	Development of new vaccines and future prospects	Miriam Tendler	Rio de Janeiro, RJ, BR
June 10th	Weaning and IMT (inspiratory muscle training) in the COVID-19 era	Lígia dos Santos Roceto	Campinas, SP, BR
June 12th	Prophylaxis and early treatment of COVID-19	Rosana Paiva	Sorocaba, SP, BR
June 15th	PrimaryCare@COVID-19 platform for the follow-up and monitoring of chronic patients	Luís Lapão	Lisbon, Portugal
June 17th	The COVID-19 prevention at workplace—the role of occupational medicine	Rose Copelman	Rio de Janeiro, RJ, BR
June 19th	PHYDIGITAL, how physical and digital are connected in the new normal	Raphael Souza Lília Porto Leonardo Aguiar	Toronto, Canada Fortaleza, CE, BR Blumenau, SC, BR
June 22nd	Care for pregnant women and babies during times of COVID-19	Natasha Silhessarenko	Cuiabá, MT, BR
June 24th	COVID-19—situation and management in Ecuador	Francisco Xavier S. Salazar	Quito, Ecuador
June 26th	Experience with COVID-19 in Qatar	Sandro Rizoli Ruben Peralta	Doha, Qatar Doha, Qatar
June 29th	COVID-19 and genetics	Salmo Raskin	Curitiba, PR, BR

Fig. 2: QR code to register presence at the end of each session

distinguished procedures, methods, and stages of the disease evolution.¹⁸

Therefore, RUTE's promotion of Telemedicine represents a strengthening of online teaching tools that were applied to a country with local health system disparities and a large territorial extension. Telemedicine, as a medical, health science, and educational methodology can result in shrinking information gaps for healthcare providers and could contribute to the build of a fully connected healthcare global community.¹⁹

With the support of an easy, free, and public online access resource, the Organizing Committee was able to select and disseminate a vast collection of medical knowledge data and new facts related to the COVID-19 diagnosis and treatment schedules.

The reality of the global health community, triggered by COVID-19, relies on quickly recognizing, selecting, and applying knowledge shared from regions that have figured how to deal with the disease.²⁰

The need to adapt to these new challenges required a flexibility that is imperative for this crisis management, as far as upended routines and patterns in the medical practice.²¹ Consequently, the creation of the SIG COVID-19 Brazil RUTE fulfilled its purpose to enhance communication, spread content, and allow distant medical services to connect with each other, in order to exchange prompt medical information, prepare for the growing pandemic and reach a higher standard of health care in many distant hospital services throughout the country.²²

To promote the use of Telemedicine in the COVID-19 era, various online resources have been developed both from regulatory agencies and private health insurance.^{23,24} Activities involving different specialties, describing views from expertise presented through the platform, helped sharing information throughout the ascending curve of severe cases. A study performed in the Shandong province in China, written by Song et al.,²⁵ described the importance of the connection between healthcare professionals in the country as well as abroad. The platform was used internally to promote personal protection videos, and it was also used to conduct remote training directed to care for COVID-19 infected patients. A variety of professionals, ranging from experts on intensive care, infectious disease, and respiratory issues were involved. Traditional Chinese medicine

practitioners were also invited to connect and divide their experience, raising more than 500,000 individuals in video conferences.²⁵

In this present study, more than 50 Brazilian speakers presented multidisciplinary lectures, followed by a debate with a question and answer period in real time, and were joined by 857 attendees in total.

This report is grounded on the first 100 day experience, and our results support that web conferences are a safe, convenient, time-saving, and low-cost solution to rapidly organize a powerful time for healthcare experts. Moreover, 10 international guests from 9 different countries presented their practical professional experiences, during different moments of the pandemic of COVID-19.

This study has limitations. The complete questionnaire rate was low because many participants did not register presence after the session. The system can control only who attended through the web conference platform, but not who watched the sessions by streaming. Some participants left the web conference immediately after the lecture and did not wait the questions and answers. Another limitation of the study was the questionnaire formulated in few questions, filled after each session, which may not be enough to check the quality of SIG COVID-19 Brazil RUTE. A new questionnaire more well structured has been created to be applied at the end of the activities, we hope until the end of the year, considering all sessions each participant attended, but without the intention of retention of information about COVID-19.

In parallel to this initiative, a similar project is in progress at a global scale, with the aim of discussing the course of the disease in different countries. Discussion topics include treatment options and obstacles regarding ways to prevent contamination, as well as the need to restructure the health care system. The Panamerican Trauma Society was already organizing weekly video conferences between several countries in the Americas and other continents, but the alarming scenario raised a need for more webinars. The American Association for the Surgery of Trauma-International Relations Committee (AAST-IRC) and the World Coalition for Trauma Care (WCTC), supported by the University of Miami and Virginia Commonwealth University, have organized a weekly videoconference about COVID-19, covering topics such as

Fig. 3: SIG COVID-19 coverage map, highlighting Brazilian capitals

operational readiness on many instances, varying from hospitals, regional and even national reach.¹⁸

In conclusion, the experience of working with telemedicine was determinant to create the innovative SIG COVID-19 Brazil RUTE, providing a fast response to professional and student needs of updated knowledge on diagnosis, treatments, and outcomes for the COVID-19 crisis management. In a brief span of time, a month after the first case was published in Brazil, this strategy covered dozens of significant themes, allowing the exchange of transcontinental experiences with participants from all over our country.

ACKNOWLEDGMENTS

Thiago Lima Verde (RUTE), Luan Meirelles (RUTE), and Antonio Carlos da Silva II (Unicamp) for their technical support; Isadora MA Fraga (PwC, Toronto, Canada) for English language review; and all guest speakers who participated at SIG COVID-19 Brazil RUTE.

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