

EXPERIENCE WITH THE BRAZILIAN NETWORK FOR STUDIES IN REPRODUCTIVE AND PERINATAL HEALTH: THE POWER OF COLLABORATION IN POSTGRADUATE PROGRAMS

Experiência com a Rede Brasileira de Estudos em Saúde Reprodutiva e Perinatal: o poder da colaboração na pós-graduação

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ABSTRACT

The scientific collaboration in networks may be developed among countries, academic institutions and among peer researchers. Once established, they contribute for knowledge dissemination and a strong structure for research in health. Several advantages are attributed to working in networks: the inclusion of a higher number of subjects in the studies; generation of stronger evidence with a higher representativeness of the population (secondary generalization and external validity); higher likelihood of articles derived from these studies to be accepted in high impact journals with a wide coverage; a higher likelihood of obtaining budgets for sponsorship; easier data collection on rare conditions; inclusions of subjects from different ethnic groups and cultures, among others. In Brazil, the Brazilian Network for Studies on Reproductive and Perinatal Health was created in 2008 with the initial purpose of developing a national network of scientific cooperation for the surveillance of severe maternal morbidity. Since the establishment of this Network, five studies were developed, some of them already finished and others almost being completed, and two new ones being implemented. Results of the activities in this Network have been very productive and with a positive impact on not only the Postgraduate Program of Obstetrics and Gynecology from the University of Campinas, its coordinating center, but also on other participating centers. A considerable number of scientific articles was published, master's dissertations and PhD theses were presented, and post-doctorate programs were performed, including students from several areas of health, from distinct regions and from several institutions of the whole country. This represents a high social impact taking into account the relevance of the studied topics for the country.

Key Words: network; knowledge management; reproductive health; graduate education.

INTRODUCTION

Health sciences seek the internationalization of knowledge and scientific collaboration meaning to achieve ways to solve the challenges and health differences, looking for equity around the world¹. Scientific collaborations can occur among countries, academic institutions and peers researchers². Once established, they guide and influence the health system, gathering data and organizing protocols to meet diverse needs, including information and communication tools^{1,3}.

Studies on maternal and perinatal health in a cooperation network are carried out in several countries in North America and Europe since the last decades of the 20th century. At least two major collaborative networks are the International Network of Obstetric Survey Systems (INOSS)⁴ and the Global Obstetrics Network (GoNet)⁵, the latter with the participation of some Brazilian researchers. Although not formally identified as a network, two initiatives from the North America should be highlighted: the Fetal Maternal Medicine Units (MFMU) network in the United States, and the Centre for Mother, Infant, and Child Research, Sunnybrook Research Institute at the University of Toronto, Canada, both working in large national and international multicenter studies for several years⁵.

In the early 2000's the World Health Organization (WHO) organized an ambitious project aiming to establish a global network of health care facilities that provided maternal health care. Since then, several network surveys have been conducted in different countries, including the Latin America⁶. Between 2000 and 2009 Brazil ranked first among the countries of Latin America in number of publications with international collaboration (57.7%)⁷.

In this context, this paper aims to present the experience of the Brazilian Network for Research in Reproductive and Perinatal Health and the positive impact in the Postgraduate Program in Obstetrics and Gynecology, University of Campinas, Campinas, SP, Brazil.

IMPORTANCE OF NETWORKING

Working in scientific collaboration networks provides multiple advantages for researchers and institutions involving: the inclusion of a greater number of participants in the studies

in shorter periods of time; the generation of stronger and more robust evidence, and higher representativeness of the population (secondary generalization and external validity); ease of publications arising from studies being accepted in journals with higher impact and scope; greater likelihood of obtaining funds for financing; greater ease in collecting data on rare conditions; including participants from different ethnic groups and cultures, among others. In addition, the expanded discussion of the methodological aspects of the projects with several researchers in the same area, substantially improves the quality of proposals and the correspondent scientific productivity.

With regard to the scientific method, there are also obvious advantages on the use of standard definitions among the different participating centers, using a common method, and also the use of specific and standardized tools for data collection, enabling uniformity in results⁴. Another aspect of great importance is the transfer of knowledge/expertise and professional training, especially for institutions with little experience in research and/or in multicenter studies⁸. Related to this last condition, updating and changing of local care protocols may also occur, with a direct impact on quality of care for population⁹. When the intervention studies are implemented, another clear benefit for the participating centers is to be able to quickly incorporate procedures, techniques or drugs with proven evidence of effectiveness, in their routine practices.

At least theoretically, when all these positive aspects in relation to the collaboration networks are present in the academic environment of less developed poles, there would be the possibility to develop and implement new postgraduate programs in regions where they do not exist yet, still benefiting professionals in these regions, as well as the teaching and the quality of health care.

Working in collaborative network also facilitates the development of prospective studies not only of traditional meta-analysis, but also of individual patient data metaanalysis (IPD meta-analysis), data collection in studies of rare conditions, the inclusion of participants from different ethnic groups and cultures with samples representative of the population groups of interest^{5,10}.

History of the Brazilian Network for Studies on Repro-

From the Programa de Pós-Graduação em Tocoginecologia, Departamento de Tocoginecologia, Faculdade de Ciências Médicas, Universidade Estadual de Campinas (Postgraduate Program in Obstetrics and Gynecology, Department of Obstetrics and Gynecology, School of Medical Sciences, Campinas State University), Campinas, SP, Brazil

ductive and Perinatal Health

The first and successful study on maternal and perinatal health performed in network in Brazil, after the turn of the century, happened between the University of Cincinnati (USA) and four Brazilian universities (Federal University of Pernambuco - UFPE, Federal University of Rio Grande do Sul - UFRGS, University of the State of São Paulo - UNESP and the University of Campinas - UNICAMP). It addressed the use of antioxidants in preventing preeclampsia, with a randomized controlled trial funded by the NIH – US National Institutes of Health¹¹. Parallel to this study, several researchers from UNICAMP were involved in research related to maternal mortality and severe maternal morbidity. They realized the limited potential of studying only locally, although in a complete and thorough way, the occurrence of low frequency conditions but with many social and system's determinants, which varied greatly from place to place. It was then clear the need for joining efforts and resources for multicenter studies addressing such issues in a planned and uniform way, as had already been occurred for decades in the country with studies on human reproduction and contraception areas.

It was precisely during this period that Brazilian researchers started looking with interest to the international experience led by the University of Toronto and surrounding countries around the world, including several Brazilian universities, which showed great potential in recruiting subjects. The Canadian experience had already started in the 90's with the leadership of Prof. Mary Hannah, with a major study on delivery in breech presentation, and then with another major study on the mode of delivery in twin pregnancies¹². This latest study definitely represented an opportunity to join several Brazilian researchers from different institutions, with visualization of a potential Brazilian network built with the perspective of the Canadian example. A contributory factor was the opportunity at the time of greater availability of financial resources for research within national agencies.

These experiences were instrumental in expanding the capabilities of research network, providing greater competitiveness to researchers when applying for national and international investments in health research. This scenario contributed to researchers of obstetrics from Brazilian universities and health institutions seek an alternative for research in maternal and perinatal health that could be at the same time professional and transforming the current reality. Thus, after the original call for the presentation of the idea and formulation of a proposal took place in a National Congress in Fortaleza in 2007, a meeting of experts which was held in 2008 in the city of Campinas, SP, Brazil, the Brazilian Network of Studies on Reproductive and Perinatal Health (RBESRP) was created, initially aimed to develop a national network of scientific cooperation for surveillance of severe maternal morbidity.

Twenty-seven centers to women's health care, in five regions of Brazil, have joined the network, and most institutions were linked to universities. Coordination of this Brazilian network was taken over by its creators, researchers from the University of Campinas, and its Center for Research in Reproductive Health of Campinas (Cemicamp). The coordination of the network is done by a multidisciplinary team of researchers, teachers, doctors, social scientists, statistician, administrators, chief financial officer, systems analyst and network manager. This team has been instrumental for the professionally and competently development of the Network's activities.

The constitution of this network was only possible because there was at the time a national situation stimulating science and technology that allowed such an initiative. Previously, the Department of Science and Technology (Decit) of the Ministry of Health, along with the National Research Council (CNPq), and after meetings with several national researchers in the field, launched in late 2007 the Public Notice 22/2007 in the area of Women's Health, which allowed and stimulated the creation and organization of a structure that would facili-

tate the implementation of major studies that could respond to national needs in the specific area. This was immediately followed in the next year by Public Notice 54/2008, also in the area of Women's Health, which selected among the researchers previously contemplated, those who had achieved the goal of riding more solid structure for the proposed research. It was in this context that the group was awarded with funds to implement its first major project: the Brazilian Network for Surveillance of Severe Maternal Morbidity¹³.

Studies implemented in the Network context

Since its establishment, five studies have been developed, some have closed and others being finalized. Two new ones are in the final stages of implementation and will soon start collecting data. Although the initial motivation and funding for the establishment of the Network have been the Severe Maternal Morbidity Surveillance project, when the network was ready, the first opportunity to participate in a major international project appeared. Thus, the first study of the Network was a randomized international controlled multicenter trial, conducted in seven low- and middle-income countries, called RHL (E-learning course of evidenced Based Medicine Incorporating the World Health Organization's Reproductive Health Library knowledge). This study aimed to evaluate the qualification, via web-oriented, of postgraduate professionals in obstetrics training between 2009 and 2010, using resources of the so-called Reproductive Health Library (RHL), funded by WHO. The course was divided into five modules and lasted 12 weeks. In the end, 46 centers for training of obstetrics and gynecology (20 of them in Brazil), participated in this pioneer study¹⁵.

The second study implemented in the network was exactly the one planned in 2008 to justify the system establishment, entitled Brazilian Network for Surveillance of Maternal Morbidity (RNVMMG) and funded by CNPq/Decit, with the participation of 27 centers (educational and research institutions) that over 12 months evaluated 83,360 births, identifying almost 10,000 cases classified as severe maternal morbidity. A principal investigator and a research coordinator participated in each center, totaling about 60 researchers involved in this study^{13,16}. This is still the largest study ever implemented by the network and resulting in a significant number of publications (besides the ongoing additional analyzes), with narrow interrelationships with the WHO Program on prevention of maternal morbidity and mortality (it was the first large multicenter study to perform the validation of the new WHO concepts and criteria for potentially life-threatening conditions and maternal near miss). Another study was precisely implemented to assess the impact of this national study and the perspective of professionals regarding the surveillance of severe maternal morbidity and its implications for the quality of maternal health care in Brazil^{8,9}.

The third study, COHELLP: Collaborative Randomized Controlled Trial on Corticosteroids in HELLP Syndrome is a randomized controlled trial started in 2010, still underway, coordinated by researchers from the Institute of Integral Medicine Professor Fernandes Figueira (IMIP) in Recife, Brazil, with the objective to include women with extremely serious complication, but low prevalence, the HELLP syndrome¹⁷. This study is an example of how ideas on research projects can come from different centers and take advantage of the network structure for its implementation. This study explores, evidently, another advantage of network studies: to enable the identification of a sufficient number of cases that are of very low frequency, which would never be possible to be performed in a single institution.

The fourth study is entitled COMMAG (Cohort of Severe Maternal Morbidity). Originally, it had two components, one retrospective to be held only in the coordinating center as a way to test the procedures and all instruments to be used; and a second, as a prospective cohort to be implemented

by identifying cases of severe maternal morbidity in the participating centers. This prospective component has not yet started and is on the list of future projects to be implemented in the Network context. The first component corresponded to the retrospective cohort that multidimensionally evaluated women who had severe maternal morbidity during pregnancy and childbirth, compared to those who did not have severe complications associated with pregnancy. It evaluated multiple medium and long term aspects of health and life of women that could be associated with severe maternal morbidity, including general and reproductive health, sexuality, post-traumatic stress syndrome, quality of life, functionality, use of illicit substances, morbidity and mortality of children, and child growth and development, all evaluated using specific standard and internationally used instruments^{13,18}. The analysis of all information collected still are underway and should lead to numerous scientific articles, some have already been submitted to indexed international journals.

The fifth was a large cross-sectional study with a case-control component entitled Brazilian Multicenter Study on Preterm Birth (EMIP), which evaluated 33,740 deliveries in 20 Brazilian health institutions in three regions of the country (Northeast, Southeast and South) involving the participation of about 50 researchers. It was the first great Brazilian multicenter study collecting information on large numbers of preterm births, either spontaneously determined, such as those associated with spontaneous premature rupture of membranes in preterm and by therapeutic appointment^{19,20}. Also this study already had other published articles^{21,22} with several other primary and secondary planned and running analysis.

These studies took place thanks to partnerships with and funding from international institutions such as WHO, and national and regional funding agencies for research (CNPq and FAPESP). More recently, two other studies are being initiated by the Brazilian Network with resources from a national agency (CNPq) and an international foundation (The Bill and Melinda Gates Foundation). Diversification of funding sources is an objective to be achieved and has many advantages: each financing strengthens the technical capacity of the group and the network in obtaining funding due to the quality of the scientific proposals; it makes easier to the network and its researchers to be included in the international circuit of scientific production and knowledge on the subject; and, most importantly, it allows an alternative to financial times like the present, where resources for research can be scarce.

These two new studies are the P5 (Pessary Plus Progesterone for Preterm birth Prevention), in which 17 centers connected to the Network will participate making ultrasound screening of short cervix in women between 18 and 20 weeks of gestational age and that will be the first clinical test evaluating pessary and progesterone in Brazil. The other study will be on the use of Metabolomics for identification and validation of biomarkers for preterm birth, entitled Preterm SAMBA (Preterm Screening and Metabolomic in Brazil and Auckland), consisting of a cohort of 1150 Brazilian pregnant women from five centers (all university centers with postgraduate programs: the University of Campinas, São Paulo; University of the State of Sao Paulo in Botucatu; Federal University of Rio Grande do Sul in Porto Alegre; Federal University of Pernambuco in Recife and Federal University of Ceará in Fortaleza) and the creation of a biobank. This study has two components: a first discovery phase to be held in Auckland, New Zealand, for identifying a number of metabolites that could be associated with the occurrence of preterm birth; and a second validation phase in which biological samples of Brazilian low-risk primiparous women will be retrospectively tested for those metabolites identified in the first phase, with an algorithm made by measuring these metabolites along with other clinical and epidemiological parameters, to test their ability to identify women with a higher of having a spontaneous preterm birth²³.

Brazilian Network for Studies in Reproductive and

Perinatal Health products

The training and qualification of professionals working in the participating institutions, providing the spread of local and regional information at different levels, possible changes in health policies, as well as changes in routines and guidelines for care, are undoubtedly results of network activities to be considered.

Under the postgraduate's perspective itself, regarding the academic products, to date these studies developed in the context of this network were responsible for at least 28 scientific articles already published, and nine submitted to publication, all in international indexed journals in English. In addition, they generated eight master's dissertations already presented and two in progress, 10 doctoral theses already finished and another eight in progress, and four finalized post-docs, involving students from different areas of health, from different regions of Brazil and several institutions of higher education from different postgraduate programs. Besides, there are still about 15 analyzes which are being processed and should result in more scientific papers related to masters and doctorates in progress.

Collaboration of the Brazilian Network with postgraduate programs

Network studies collaborate to the growth and qualification of postgraduate programs. From the establishment of the network, there was an improvement in the quality of structure for research available to all faculty and students, as well as in publications from more robust studies with larger impact on national and international scientific literature. In Figure 1 previously published articles of each study in the Network are quantitatively compiled, so far, according to the categorization of the Qualis Capes system in the year of its publication.

WebQualis Strata	E-learning RHL ^{14,15}	RNVM MG ^{9,13,16,24-37}	COHELLP ¹⁷	COMMAG ^{18,38,39}	EMIP ¹⁹⁻²²	%
A1-A2	1	10	—	1	3	53,6
B1-B2	1	8	1	2	1	46,4
Total	2	18	1	3	4	100%

FIGURE 1 - Published studies of the Brazilian Network for Research in Reproductive and Perinatal Health in accordance with the WebQualis strata

As can be seen in Figure 1, the resulting articles of the Network's studies were published in higher impact journals compared with the distribution of journals of the area of Medicine III at the triennial assessment of 2013, in which 23.4% of the articles in the area were in A1-A2 strata journals, 44.3% in B1-B2 and B3-B5 in 32.24%⁴⁰.

Among these studies, four were designed and conducted by Unicamp, one by WHO and one by IMIP. The UNICAMP Postgraduate Program in Gynecology and Obstetrics received 12 students from different regions of Brazil, including four masters, six PhD and two post-doctoral. Most of these post-graduates perpetuate research activities and consequently initiate or participate in new postgraduate programs or collaborate with the qualification of already existing programs, with teaching and/or research activities.

Authorship in the Network papers

All scientific articles derived from these studies have as co-authors all researchers of the centers of the Network. To avoid any misunderstanding or dispute, these agreements are pre-specified in the respective research proposals. The coordinating center that developed and proposed the study in question, is also responsible for the management of data, database creation after the necessary consistency check procedures and data cleansing, planning of data analysis, and proper statistical analysis. The principal investigators of the study coordinating center are also responsible for determining a group of researchers who will write the first draft of the

article, reviewed by all participants who must agree with its submission. Each participating center has unrestricted access to the data of its specific center, and to all data of the multicenter study for secondary analyzes, whenever they submit a brief "concept paper" with the planning of the intended analysis to the coordinating center. Researchers from other centers are encouraged to seek funding in their places of origin to sponsor these secondary analyzes that are usually not planned nor covered from the beginning of the study. This appreciation of network participation enables visibility and motivation for future work. The co-authorship in Network studies is recognized by scientific journals, and the names of all collaborators researchers also are indexed in PubMed, in addition to the main authors of the paper. This is changing the old model of valuation of authorship of papers following a worldwide trend and should thus be valued and encouraged. This is obviously different from that situation of a researcher from a center to provide data from a few patients to pharmaceutical multicenter trials, without having participated in the design, implementation of the study, planning analysis, interpretation or writing the correspondent article.

DISCUSSION

The building of scientific collaboration networks and the success with their results, put researchers together around a common goal for the advancement and improvement of structure for research, in addition to the search of new knowledge and new solutions in healthcare. This is a global trend that is not new, but recently has expanded into the area of

maternal health, being mostly conducted and/or coordinated in high-income countries^{4,5,41}. The experience now reported, to the best of our knowledge, is the first reported as fully developed in the context of an middle-income country^{13,16}. Some of the existing networks have also implemented their studies in low- and middle-income settings, however coordinated from high-income countries or by international organizations^{6,41}. More recently, a similar experience was reported in a low-income country, Nigeria, and it is expected that this trend may be successfully reproduced in other contexts, which means unquestionable advantages for the local health.

Working together therefore consequently results in the improvement of maternal and perinatal health care and, moreover, contributes to the knowledge of the health specificities of each region and Brazilian contexts. The data generated by network studies have the potential to be used by official agencies to develop and implement health policies, since they are comprehensive and rich in information.

We see the building of collaborative networks as a non-going back way to be followed by researchers, and will certainly grow in our country too. To report our experience with networking and the consequences for our postgraduate system is a motivating opportunity because we believe in the potential of Brazilian scientists for settling new research networks. Moreover, this opportunity is vital for the dissemination of knowledge, especially to postgraduate students who will certainly play an important role in the research operationalization.

RESUMO

As colaborações científicas em rede podem ocorrer entre países, instituições acadêmicas e entre pares de pesquisadores e, uma vez estabelecidas, contribuem para a disseminação do conhecimento e estruturação da pesquisa em saúde. Diversas vantagens são atribuídas ao trabalho em rede como: a inclusão de maior número de participantes nos estudos; gerar evidências mais fortes e com maior representatividade da população (generalização secundária e validade externa); maior facilidade das publicações oriundas dos estudos serem aceitas em periódicos de impacto e abrangência; maior probabilidade de obtenção de verbas para financiamento; maior facilidade na coleta de dados sobre condições raras; inclusão de participantes de diferentes grupos étnicos e culturas, entre outras. No Brasil a Rede Brasileira de Estudos em Saúde Reprodutiva e Perinatal foi criada em 2008 com o objetivo inicial de desenvolver rede nacional de cooperação científica para vigilância da morbidade materna grave. Desde sua formação, cinco estudos foram desenvolvidos, alguns já encerrados e outros em fase de finalização, com outros dois em fase final de implantação. Os resultados das atividades desta Rede têm sido bastante produtivos e impactaram positivamente não apenas no Programa de Pós-Graduação em Tocoginecologia da Universidade Estadual de Campinas, seu centro coordenador, mas também o de outros centros participantes, uma vez que expressivo número de artigos científicos foi publicado, mestrados e doutorados foram defendidos e pós-doutorados finalizados, de alunos de diversas áreas da saúde, de diferentes regiões e de várias instituições de todo o país, com alto impacto social dada a relevância dos temas estudados para o país.

Descritores – Rede; Conhecimento; Saúde Reprodutiva; Ensino.

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