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International Society for
Telemedicine & eHealth

2020 RETROSPECTIVE: YEAR OF THE NURSE & MIDWIFE

INTERNATIONAL SOCIETY FOR TELEMEDICINE & EHEALTH

2020 RETROSPECTIVE: YEAR OF THE NURSE & MIDWIFE | MARCH 2021

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International Society for
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About The International Society For Telemedicine & Ehealth

The International Society for Telemedicine & eHealth (ISfTeH), is a nongovernmental and not-for-profit society that services primarily as the umbrella association for national Telemedicine and eHealth organization. Geopolitically neutral and democratic, the ISfTeH exists to facilitate the international dissemination of knowledge in Telemedicine and eHealth and to provide access to recognized experts in the field worldwide. The main activities of the society are promotion and support of Telemedicine and eHealth activities worldwide, assisting the start-up of new national organizations and supporting developing countries in the fields of Telemedicine and eHealth.

The ISfTeH Telenursing Working Group envisions nurses extending their reach through technology and improving the quality of healthcare delivery worldwide. Its mission is to provide a forum for exchange of knowledge and experiences of nurses, midwives and others who are working with or supporting nurses using eHealth applications. The Working Group is a platform for networking and collaboration. It organizes regular webinars and other activities in which members can present best practices, research and other relevant issues. Membership in the Telenursing Working Group is free of charge.

The ISfTeH Working Group on Women develops actions to support and promote the role of Women in the areas of telemedicine and eHealth in the world. It aims to develop collaborations with other WGs, The Journal of the International Society for Telemedicine and eHealth (JISfTeH) and international partners to make women visible in international conferences and scientific publications.

The Journal of the International Society for Telemedicine and eHealth (JISfTeH) is the official Journal of the ISfTeH. It is a peer-reviewed, open access, online journal that seeks to disseminate information on all aspects of eHealth activity and research from around the world. Its primary focus is on original research, critical reviews, preliminary communications and case reports. Papers are published online on acceptance of final galley proofs. Authors retain copyright under Creative Commons License 3.0 and the Journal does not charge article processing fees.

About International SOS

International SOS is the world's leading medical and travel security risk services company. It provides 24/7 care for clients across the globe in more than 1000 locations in 85 countries and aims to protect a global workforce from health and security threats. As a company we utilize telehealth and telemedicine extensively, and have a large international workforce comprised of medical professionals with a significant population of nurses who work across all areas of the business and parts of the world.

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WHAT DOES COVID-19 MEAN FOR DIGITAL HEALTH AMONG NURSES & MIDWIVES?

In January 2020, the International Society for Telemedicine and eHealth (ISfTeH) Board of Directors approved funding for a celebration of nursing and midwifery during 2020, it being the WHO Year of the Nurse and Midwife. ISfTeH has long been friendly to nurses and midwives, with great encouragement to make presentations at the organization's conferences and on webinars and to publish in the Journal of ISfTeH. Moreover, membership is free for nurses. The celebration would launch a set of nurse- or midwife-authored papers in a special theme issue of the Journal of ISfTeH in recognition of the year and it would take place during the World Health Assembly in May, 2020. This would be preceded by a preview release of the JISfTeH Special Theme papers at the ISfTeH Spring conference in Lisbon: Digital Health Global Commons. Of course, all these plans were neutralized by the COVID-19 pandemic as it took the whole world by storm.

Now, one year later, we have developed this monograph to mark the ISfTeH Celebration of Nursing and Midwifery. The set of five papers with their accompanying editorial has been published in the JISfTeH. It is our hope that the monograph will be a glimpse of the thoughts and experiences of nurses and midwives as we integrate digital health concepts and applications into our clinical, education, management and research fields of work.

With the concepts of digital health, telehealth and telenursing grounding us, we asked leaders in nursing and midwifery for commentaries about 2020 and we asked all ISfTeH nurses and midwives to tell us how they were affected by COVID-19 during 2020. We know that nurses in clinical settings have been working to exhaustion so we asked for just a short entry – something that really stood out for them. Also included in the monograph are the JISfTeH papers and the references for all nurse- or midwife-authored papers in the 8 volumes of the JISfTeH.

Looking ahead, what does the future hold for digital health and nursing? We hope that we will see a great reckoning for nursing – a shaking out of the cover quilt, so to speak. The whole of nursing and

midwifery, no matter if in low-, middle- or high-income countries, has been more or less shattered by COVID-19. Nurses on the front lines are working long hours with death being omnipresent and families prohibited from seeing their loved ones. Some nurses even work without the necessary protective equipment. Nurses worry about bringing COVID-19 home to their families. Nurses are experiencing physical and mental health trauma and breakdown. Nurses are dying of COVID-19. Positive, proactive interventions are needed now for these problems. People in leadership positions need to step up for nurses and all involved with the provision of care.

Nurses and midwives, including those not on the front lines, are looking ahead and anticipating that many will leave the profession during or just after this pandemic. Many aspiring nurses and midwives will choose not to enter the profession. It will be the nursing shortage to end all shortages. Triage due to insufficient nursing staff could become standard operating procedure.

Digital health can help with nurse recruitment and retention. For example, schools of nursing are learning fast to exploit face-to-face, hybrid and



virtual learning environments. Clinical settings can apply more decision support, robot interface, artificial intelligence and big data to get at working with the critically ill and with people and populations to prevent, lessen or control health risks that anyone concerned with health care now knows result in shorter life spans. Nurses have known this for decades.

Advancements in digital health also benefit people with their healthcare needs. They can be more proactive in their pursuit of healthcare and take on greater responsibilities for their health, with virtual health services and support. Virtual presence in the homes of people with chronic diseases, for example, has shown substantial benefits in self-management of their medication, nutrition, activity and risk factor prevention needs.

Maybe, finally, the large body of nursing research that finds patient outcomes are better with the right professional nurse staffing will be recognized and applied in practice settings. Nurses will be at every table where decisions are discussed and taken. Furthermore, nurses' pay and benefits will be appropriate to their skills, knowledge and abilities and will be commensurate not only with their contribution to health and care, but also with other professionals in their environment.

Claudia C Bartz, PhD, RN

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NURSING & TELEHEALTH

OVERVIEW

International SOS is the world's leading medical and travel security risk services company. We provide 24/7 care for clients across the globe, in more than 850 locations in 92 countries. We are very proud to have a highly experienced team of nurses working right across Europe, Middle East and Africa. Our nurses are based in our Assistance Centres which act as regional hubs to support our clients and members globally.

The pandemic has been a constantly evolving and changing situation in which our nursing teams have been called upon to keep adapting to support our clients and members globally. It has been absolutely incredible to see how well our nursing team has adapted to this ever-changing 'new normal'. They have remained positive, resilient and impressive in their commitment to patient care in the most challenging of circumstances. The International Year of the Nurse it most certainly has been, and as an organization we could not be prouder of how well our team has stepped up to every challenge.

THE ROLE OF THE NURSE AS A CASE MANAGER

Our nursing team is large and diverse; most of our nurses come from an acute care background with experience in emergency medicine and intensive care. We also have many nurses who are used to working autonomously in remote environments, including in humanitarian work, cruise ship nursing and the military. Transitioning to medical assistance is an excellent opportunity for nurses with this background because the role is incredibly diverse and requires: a strong medical skill set; fast and safe

decision making; a robust understanding of global and public health; and, of course, genuine care and compassion for people experiencing immense health challenges while abroad.

Working in the context of case management requires the nurse to be able to multitask, prioritize and manage a number of systems simultaneously, while providing evidence-based medical advice and support via a telephone and case management system.

The types of case management support we provide are: pre-deployment advice and travel-health-related guidance; general medical advice and remote support; medical triage to accurately assess and refer into local care; medical monitoring of inpatient care; and, the medical and logistical management of patients in flight.

Many of our team have trained extensively in aviation and, after a careful assessment of a patient's fitness to fly, also act as flight nurses to transport them back home or to a medical center offering a higher standard of care. We have teams of flight nurses who work in the assistance center managing the case from the first call right through to a medically escorted flight on a scheduled airline, to specialist teams of nurses who work in the air ambulance environment out of Johannesburg who have moved many COVID-positive patients throughout the region this year along with a whole range of other critically unwell patients.

Throughout the pandemic, alongside their roles as case managers, many of our nurses also continued or returned back to hospital-based nursing to support intensive care departments and emergency departments in their local health systems.

2020 - A YEAR OF CHALLENGES

We saw a significant surge in our case activity globally from January to March 2020 as the pandemic began to set in. We needed to keep our teams up to date with the most recent, evidenced-based information about COVID-19 and the impact it was having on travel, border control, and the quickly changing health infrastructure.

As the disease continued to spread, we saw a varied healthcare response to the demand on services, which has continued to evolve all year. We kept a close track on the medium- to high-risk locations where some of our expatriate clients remained, as local health systems struggled to cope with the unexpected demand on services.

We often see challenges for our members in being able to access care for routine or elective procedures or for those requiring earlier intervention in areas with a high standard of care. So, again, we must ensure greater support and rapid assessment to ensure optimal health outcomes for individuals.

There are continuous challenges around medically evacuating our members out of country to upgrade care, or to repatriate them back to their home country as a result of the impact of COVID-19 on the airline industry. This also means that members may need to stay longer locally than we would usually recommend, or we may risk assess and use an air ambulance to transfer them safely, depending on availability and multiple logistical factors. The usual challenges of medical decision-making around fitness to fly and the risk versus benefit of moving an unwell patient increased exponentially, especially when transferring COVID-positive patients in portable medical isolation units. In areas where there are fewer resources for intensive care, speed and accuracy of assessment is critical.

Obtaining a detailed pre-flight medical report over the phone is key to gauging the safety of a transfer, the timelines for movement and the choice of medical transportation.

There has also been a significant impact on the emotional resilience and mental health of travelers and expatriates. When assessing our members' physical health, we must always keep in mind any potential mental health impact. Many of our clients are based offshore or in very remote locations, often on long rotations there, and being far away from home for so long can take a toll, especially if complicated by an extended quarantine.

“
Speed and
accuracy of
assessment is key
..... ”

BESPOKE NURSE-LED SUPPORT AND ADVICE LINES

Throughout this period, we have established several dedicated COVID-19 advice and support phone lines to support our clients' employees in their home locations. These are nurse-led solutions that provide outreach and tailored medical advice and recommendations relating to: COVID-19; assessment and referral for COVID-19 testing; advice and education on isolation and quarantine; medical assessment and follow up; return to work guidance; and contact tracing.





TELEHEALTH SOLUTIONS

International SOS has always relied on telehealth, with a well-established network to provide remote support and consultation, but we relied on it even more often in 2020, for many of the reasons outlined above.

After the nursing team conducts a thorough telephone triage and assessment of the presenting medical condition, they then identify what else is required medically in terms of both immediate management and longer-term care. Depending on what is required, as well as the standards and accessibility of care locally, they may leverage further telehealth solutions such as specialist consultations and reach-back services and prescription support to negate the need for face-to-face consultations. We can also refer for remote teleradiology solutions using DICOM uploads, in which the role of the nurse is to coordinate care and medically manage the overall case.

We have been able to quickly develop bespoke solutions for several clients – one in particular needed a robust telehealth solution which encompassed teleradiology, remote cardiology and respiratory support for medically staffed remote sites in resource-poor areas. This has been well-used by the client to provide support and reassurance not just for individuals, but also medical professionals often working as a lone health practitioner. Using such interventions and support, we are much better able to support our own staff on remote sites and enhance the overall level of care for the patient.

We also provide this service to clients who are located on commercial shipping vessels at sea. While at sea, it can often take a long time to be able to safely transfer mariners to a safe port and appropriate care, so nurses need to be able to triage,

assess and support mariners until they reach shore and obtain a shore-side review. One very common issue faced by many mariners is dermatological conditions resulting from their working environment. We can provide a reach-back service using a secure encrypted cloud-based server to upload images and obtain specialist dermatology advice, which can prevent unnecessary disembarkations.

Telepsychology has also been a key area of support that has been identified as a critical need throughout this pandemic, and given the ongoing volatility and reduced resilience associated with a prolonged crisis, will continue to be an excellent reach back capability for our nurse case managers to access as and when they identify a need.

THE YEAR AHEAD

It certainly has been a year of challenges but our nursing team has worked admirably with a great degree of resilience and commitment to fulfilling their duty of care. Along with the challenges the pandemic has also brought many opportunities and it has been a fascinating journey to see how our organization has evolved and changed, to continue to always place patient centered care in the forefront and utilize technology and telehealth solutions even more than ever. We look forward to seeing what the year ahead will bring.

Kerryn McGowran
International SOS

INTERNATIONAL COUNCIL OF NURSES CHIEF EXECUTIVE OFFICER HOWARD CATTON

The global nursing community started 2020 with high hopes. The International Council of Nurses (ICN) had lobbied the World Health Organization (WHO) about the need to take seriously the worldwide shortage of nurses, and it had responded by designating 2020 as the International Year of the Nurse and Midwife.

There is expected to be a shortfall of up to six million nurses by 2030 if governments do not take immediate action to remedy the situation, and the Year of the Nurse was intended to celebrate the work of nurses and highlight what needs to be done to correct this historical shortfall.

But 2020 was always going to be a special year for nurses, because it marked the 200th anniversary of one of modern nursing's founders, Florence Nightingale. The celebrations planned included a service in London's Westminster Abbey commemorating Ms Nightingale's birthday on May 12, and countless other conferences and events around the world throughout the year.

But then COVID-19 struck. Suddenly a wave of respiratory infections spread around the world, and the public health measures needed to prevent health services from being overwhelmed locked societies down in a way we have never seen before.

As people hunkered down in their homes for weeks only going out for essential provisions and to take daily exercise, nurses stepped up to the front line, where the dangerous work of caring for the sick took place.

The truth is we all knew that a pandemic was possible: the horrific events of 1918 showed the devastation such infections can cause, and while most countries had plans about how to deal with

one, in most cases they ended up being inadequate. Personal protective clothing was of poor quality or in short supply, there was not enough spare capacity in health systems to deal with the anticipated need for intensive care beds, and some of the most vulnerable people in care homes were exposed to the virus, with catastrophic results.

ICN knows from its own research that 2,710 nurses have died of the virus, which is more than the number who died during World War I, and we suspect that when the final reckoning comes that number could be in the tens of thousands. Every death is a tragedy, but for nurses to die having caught the virus while caring for others is a calamity that should never have happened. We continue to campaign for standardized and systematic data to be collected by all countries on the number of nurses and other healthcare workers who have contracted COVID-19 and the number who have died from it. Such information is vital to honor those who have made the ultimate sacrifice, but also because it could lead to information that could save more lives in the future.

ICN was involved early on in sharing news about the pandemic with its 130-plus national nursing association members, and we have continued to carry out that role so that nurses have the best chance of making a difference for their patients. We have provided a mass of materials on our website. We have also issued messages of support, solidarity and condolence to the global nursing family during this most difficult of times.

Throughout the year, ICN has worked closely with the World Health Professions Alliance in calling for abundant amounts of appropriate personal protective equipment for nurses and other healthcare

staff. Although in many countries great strides have been taken in securing supply lines, in others nurses are still working with just a pair of gloves and a paper mask, and it must never be forgotten that in some of the poorest countries, they are fighting this infection and others without even access to clean running water.

The publication of the WHO/ICN State of the World's Nursing report in April revealed that there are 27 million nurses in the world and highlighted the need for a properly resourced, educated and led nursing workforce to enhance the health and wellbeing of everybody on the planet. The United Nations Strategic Development Goals (SDGs) will not be met if drastic action to augment and enhance the global nursing workforce does not take place over the next decade.

We have shone a spotlight on the abuse and violence nurses have suffered at the hands of some communities, which has come about partly because poor public health messaging has led to misunderstandings about how the virus is transmitted.

We published a report about nurse immigration during the COVID-19 pandemic and the need for all countries to become self-sufficient in the supply of enough nurses to meet their own needs. Of course, nurses should be free to choose to work overseas if they want to, but if high-income countries continue to recruit large numbers of overseas nurses, they will undermine the ability of low and middle-income countries to cope with the virus and dangerously weaken health systems in those poorer countries.

ICN has worked with international media outlets to highlight the work of nurses throughout the pandemic, ensuring that their selfless efforts must not go unnoticed or unrewarded. Most nurses around the world have been through more than a decade of austerity: it is important that the world does not turn its back on them now, after all they have done.

Make no mistake, the pandemic has taken a terrible toll on nurses. Many worked for weeks on end, staying away from their families to ensure that they did not put them at risk. Many have suffered

bereavement following the deaths of their dear colleagues. ICN has called for essential mental health support on the front line to be freely available to help them cope with already depleted resources in what is a challenging and ongoing battle.

One highlight in what has been a terrible year was ICN President Annette Kennedy's acceptance on behalf of the world's nurses of the International Aids Society's President's Award in recognition of nurses' "courage, selflessness and stoicism" in fighting Aids and COVID-19.

Those three words - courage, selflessness and stoicism - sum up beautifully the prevalent attitude among my 27 million fellow nurses. Courage in the face of the dangers they face, selflessness in the sacrifices they have made, and stoicism in their acceptance that caring is their fate.

2020 demonstrated how closely our health is linked to our general wellbeing and our economic prosperity. It has been a year like no other, certainly one we are inclined to want to forget. But we should never forget the painful lessons it has taught us, and we must never forget those who gave their lives while doing their duty for the good of humankind.

2021 holds promises of a brighter future, and with vaccines on the horizon, it should enable us to restore some of many of the freedoms we took so much for granted, but so quickly lost. The success of the planned immunization programs, however, will depend on the involvement of nurses at all levels, from people's front doors and local medical centers, to the policy making tables in government departments of health. Engaging nurses now in vaccination programs will pay dividends in the future.

Nurses have shown their worth in ways that our planned celebrations for the Year of the Nurse could not have achieved. Governments should now invest in more nurses, in their training and in their leadership, so that the SDGs can be met and universal healthcare can finally become the reality all the people of the world deserve it to be.



Howard Catton

Chief Executive Officer
International Council of Nurses

NURSES NOW: A REFLECTION ON 2020, YEAR OF THE NURSE AND THE MIDWIFE

Nursing Now's goal has been to improve health care by raising the profile and status of nursing. When the WHO designated 2020 as the International Year of the Nurse and the Midwife, it felt like a once in a generation opportunity to propel nursing into the spotlight and onto the agenda of governments globally, with the ultimate goal of improving health for all.

The COVID-19 pandemic changed everything. It wasn't the year that had been planned but in 2020 a light shone brighter than ever on the incredible work of nurses around the world. Nurses turned up, every day, often without the right equipment and protection, providing care and comfort. This terrible pandemic has demonstrated just how essential nurses are to health care, providing sophisticated clinical skills delivered with empathy. The world will never see nurses in the same light again.

Nurses have a unique role in keeping the world healthy and we have reached a critical moment when it is vital that we address the global shortfall of 5.9 million nurses by investing in the recruitment, education, decent work and leadership. The State of the World's Nursing report (SOWN), developed by the WHO in partnership with the International Council of Nurses and Nursing Now, published in 2020 was a key milestone for nurses everywhere. It provides much-needed data and evidence behind calls to strengthen nursing leadership, advance nursing practice and educate the nursing workforce for the future.

A GLOBAL MOVEMENT FOR THE FUTURE OF GLOBAL HEALTH

Nursing Now has united nurses, health advocates and allies from around the world in the first ever global social movement to champion the role of nurses. In the three years since its launch, Nursing Now grew to have a presence in 127 countries with over 700 groups around the world active in raising the status and profile of nurses. Throughout 2020, the campaign used social media and virtual events to connect tens of thousands of nurses and extend our reach to make the case to decision makers globally.

Nurses are already leaders, advocates and innovators but are not always valued or represented in health system leadership roles where they can guide health policy and investment decisions. Nurses can be the answer to many of the world's health problems but only if the barriers that are put in their way are addressed, and they receive the right support and training. To inspire a new generation of nurse and midwife leaders, Nursing Now launched the Nightingale Challenge and over 700 health employers signed up to develop the leadership skills of over 30,000 early career nurses and midwives during the Year of the Nurse and the Midwife.



LOOKING AHEAD

Leading on from the publication of the State of the World's Nursing report, the WHO's Strategic Directions on Nursing and Midwifery, currently under development, share policy options that can help to strengthen the workforce. These policy approaches should enable nurses and midwives to contribute fully to implementing national health goals, such as primary health care, battling the COVID-19 pandemic and rebuilding a stronger health system afterwards.

The work of the International Society for Telemedicine and eHealth in advancing digital health is essential in helping to shape health care of the future. The innovative and strategic use of digital information and communication technologies has the power to transform health care - improving health standards and ensuring access to services. Nurses globally are helping to champion this digital revolution and Nursing Now hopes to see more and more nurses leading the way by developing and scaling up digital health solutions.

The Nursing Now campaign is in a transition phase and will be ending in May but not before there is one final push to get nursing onto the agenda of ministries of health globally. Nurses Together is a rallying call to nurses and allies to connect directly with decision makers in the weeks running up to World Health Day on April 7. We must emphasize the importance of advancing the health of the public by investing in nursing - the foundation to a global recovery from the COVID-19 pandemic. To join, you can access the Nurses Together toolkit or follow us online at [#NursesTogether](https://twitter.com/NursesTogether).

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Strategic use of
digital information
& communication
technologies has the
power to transform
health care
..... ”

Dr Barbara Stilwell

Executive Director
Nursing Now

Kathryn Irwin

Communications Director
Nursing Now

Submissions

Name

Kumiko Adachi

Nurse Midwife

Organization

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Job Title

Professor, School of
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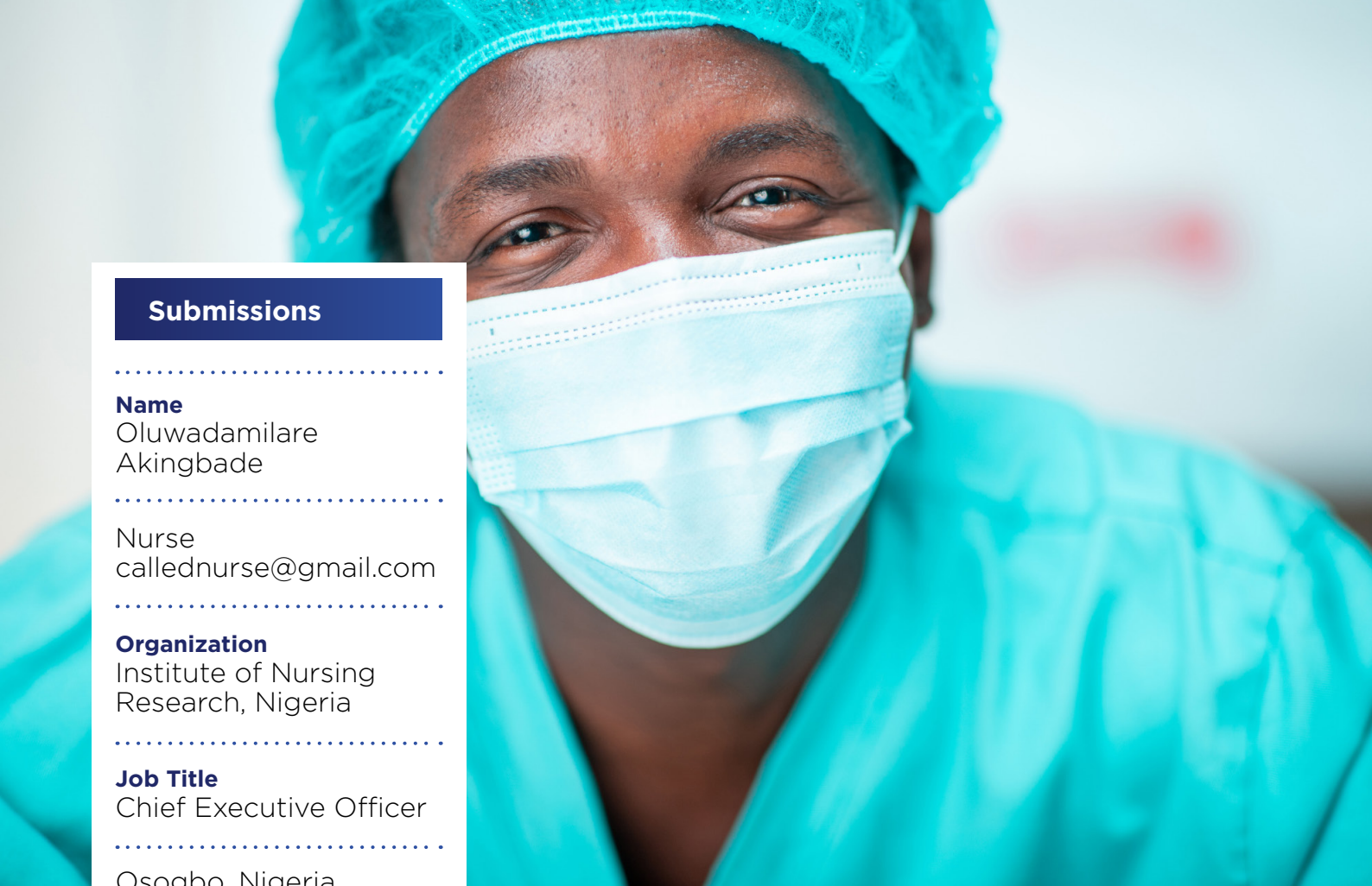
On April 7th, 2020, the Japanese Prime Minister declared a state of emergency for seven prefectures due to a surge in COVID-19 infections. We were not given much medical information at that time. The normal plans for birthing for mothers and their families were affected by COVID-19.

After the state of emergency was announced, the Japanese Midwives Association notified our members to bar extra people such as partners and family members from the delivery room.

Online attendance using the smartphone started at Maternity House after that. Partners and family members would observe via wi-fi connection and cheer on the mother. The mothers said they

heard the voices of their partners and other children as if they were in the same room and not far away. The family could relax at home and then become excited saying things like “My sister is coming!” or “Thank you mother!” or “Thank you!”.

The midwife who runs a Maternity House was the first person who thought of ‘remote attendance’ for those who could not attend the birth due to COVID-19. She advised that it was particularly good for the other children as they could relax – eating and sleeping at home while waiting for the birth. The mother could relax as her children were relaxed.



Submissions

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Name

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Organization

Institute of Nursing
Research, Nigeria

.....
Job Title

Chief Executive Officer

.....
Osogbo, Nigeria

Although the COVID-19 pandemic threw many off-balance, for the amazing team of nurses I lead at the Institute of Nursing research, Nigeria, they were prepared! INR Nigeria, a non-governmental organization passionate about building the capacity of nurses in research, had already mastered the art of conducting research endeavors virtually from its existence in 2016.

Waking up on 24 March 2020, a thought came to my heart that we should conduct a week-long conference for nursing students and nurses virtually amid the COVID-19 lockdown. Although the tension in town was palpable, we decided to take the bull by the horns. On sharing the vision with Fawole Israel, the 2019/2020 National President of the Nigerian

Universities Nursing Students Association (NUNSA), he believed it was not insurmountable. He was ready to fly. We launched into aggressive planning and mobilization. The two organizations collaborated and the program was a huge success. The seven-day conference lasted from Sunday 10 May to Saturday 16 May 2020 with the theme “Building the Competencies of the 21st Century Nurse in Research and Scholarly Activities.” We had 14 speakers from five countries for the 7-Day conference. In attendance were 278 nurses and nursing students from the six geopolitical zones of Nigeria. (info@innigeria.org)

In September 2020, I resumed my PhD program at the Nethersole School of Nursing, Chinese University of Hong Kong where

I am currently developing a mobile application to support women undergoing breast cancer chemotherapy in Nigeria. The project is in three phases, the last being a randomized controlled trial.

Although the 2020 was full of ups and downs, for us at INR Nigeria it was a blessing in disguise as we also launched our Journal Club in November 2020.



Submissions

Names

Claudia Brasil Cunha & António Bettencourt

Nurses

Organization

International SOS

Job Title (Cunha)

Community Nurse Specialist

São Jorge, Azores Archipelago (Portugal)

A NURSING PERSPECTIVE OF TELEMEDICINE ON AN ISLAND

São Jorge, is an island in the Azores Archipelago (Portugal) with about 9K habitants who make a living from dairy farms, fishing, tourism and services. With two public health centers, just over 30 nurses and 5 family physicians, there is no local hospital accessible by land. Although this place is paradise on earth, it has its shortfalls and poses challenges when it comes to accessing healthcare. Not only emergency care, but also standard primary care such as maternity, paediatrics, complex radiology, medical specialities, surgeries, oncology treatments, etc, are referred out to another island, usually Terceira, or even, very often, to mainland Portugal.

In this context of being an islander, teleconsultation is a valuable resource that has gained greater importance over time, even more in the current pandemic, reshaping the current way of practicing, bringing benefits to both the population and medical professionals. An example has been within the anaesthesiology speciality. A closer cooperation between the nursing teams of both health centers and the anaesthesiology team at Santo Espírito Hospital in Terceira Island, has established a recurrent video conference meeting which allows providers not only to share complementary exams (ECGs, x-rays, blood results) but also to place the anaesthetist in front of the patient for an initial introduction to the entire anaesthetic process.

In Calheta Health Center, this meeting is led by the Family Nurse Specialist. After obtaining a signed consent, the families and the nurse discuss with the anaesthetist the assessment

process which includes biometric assessment (BP, pulse, height/weight), past medical and surgical history, allergies, regular medication, alcohol and tobacco use, previous admissions, use of dentures and other personal specifics. Beyond the medical aspects of the discussion, this is a unique opportunity for the patient to establish direct communication with the anaesthetist and ask questions about the process beginning to end. The nurse leads that discussion, ensuring that the conversation responds to patient's needs.

The use of teleconsultation is an asset as it leverages the access to healthcare among a very remote population. It is also cost-saving as it takes away the need for flights, accommodation, and per diem expenses on another island. Another substantial aspect to highlight is the benefit that it brings to specific groups, such as the disabled, elderly and other vulnerable people who many times don't access care due to the fear of flying, decreased mobility, financial concerns or other social constraints.

From a nursing practice point of view, and considering the geographic limitations, teleconsultations are an effective resource that promote excellence and bring substantial benefits to the population and to the whole team in a limited-resource healthcare system. Teleconsultation is an important resource that nurses have at their service to maximize healthcare delivery.



Submissions

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Nurse

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.....
Organization

Virtual University of
Medical Sciences &
Tehran University of
Medical Sciences

.....
Job Titles

Head of Nursing
Informatics Department
(VUMS), Lecturer
(TUMS)

.....
Tehran, Iran

DID 2020 CAUSE ME TO THINK ABOUT ENABLING NURSES PURSUING EDUCATION IN INFORMATICS? (VUMS)

I found that in this situation (of COVID-19) people need nursing remote care more than ever. So, I decided to expand online educational programs to enhance nurses' knowledge about IT and the application of informatics tools in the nursing profession and telenursing. Today, a nurse's job not only offers care services inside the hospital building but equally offers online and remote care. Therefore, in the Virtual University of Medical Sciences in Iran I, as the head of Nursing Informatics Department, together with our brilliant faculty members, recorded courses that were based on competencies of informatics nurses.

117 nurses participated in our six-month modular courses with 14 online sessions. Participants were able to access and study resources without restriction of time or place 24/7. https://vums.ac.ir/?page_id=20442 It was a wonderful experience and the first program about NI in Iran. We are going to continue to educate more nurses with these initial level courses. In addition, we are going to prepare intermediate and advanced level courses due to positive demands and requests of nurses.

WHAT I LEARNED FROM TELEHEALTH-RELATED EVENTS IN 2020? (TUMS)

Telenursing services and webinars have spiritual value. I learned that a nurse might be an angel when a pandemic occurs! Telenursing activities are in high demand when people have to stay home.

Here are some activities of the School of Nursing and Midwifery

of TUMS which have had a positive impact on the community during the COVID-19 pandemic and the year of Nursing and Midwifery.

We had many online teaching experiences. We had a good experience with telephone-based consultation in all areas of nursing and midwifery care as a free service to help people who had to stay at home. This service started in March 2020 and it continues now. We also have WhatsApp support groups. We added web-based programs to both services on <http://fnmeclinic.tums.ac.ir> All are in the Farsi language. The audience has been very satisfied.

We provided about 30 webinars about self-care in the first 6 months of the pandemic. These are mostly are recorded and available for free on the website.

<https://fnm.tums.ac.ir/section147/page2/lang/Fa> 70 more webinars from the last 4 months are also available at this website.

As the pandemic experience added value to the nursing informatics and telenursing fields, another recent activity is an international and free short course entitled "Fundamentals of Nursing Informatics". This event will be held on Feb 20, Feb 27, March 6 and March 15, 2021, 15:30-17:30 GMT.

The link for more information and free registration is at: <http://en.tums.ac.ir/en/content/546/fundamentals-of-nursing-informatics>

The free registration form is at:

https://docs.google.com/forms/d/e/1FAIpQLSf0ZEzL6jTdjOTqwMqGSyZ70VpSizT9XcvNLDBMUOc19JcgQ/viewform?usp=sf_link

Be safe and healthy. I wish the best for all nurses.



Submissions

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Organization

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Job Title

Faculty
.....

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2020 THE INTERNATIONAL YEAR OF THE NURSE AND MIDWIFE

Telehealth has become a necessity. Without telecare standards, the daily life of nurses has become difficult. 2020 was also a time of transformation for patients who had to be taught to use digital health and mHealth and to wait for a call from a doctor who might prepare an e-Prescription. For example, a chronically ill patient might receive an e-Prescription so that he could catch his breath and give him a chance to continue treatment while waiting for access to health services.

Remote teaching of nursing students has become a challenge. Teaching activities without face-to-face contact required creativity and the learning of new tools. To prepare the lecture as I wanted, for example, I had to use 4 different tools, because each tool had its limitations. And we only had access to the free versions of digital products.

2020 was a year of great success for interoperability in nursing documentation in Poland. The International Classification for Nursing Practice (ICNPTM) pilot has been completed and the nurses have welcomed the classification.

What have I learned? I have learned that it is worth investing in the development of digital competencies, enthusing nurses with them and showing what digitalization can give to nursing.

In Poland, nurses have been prescribing medications since 2016. The pandemic has resulted in the acceleration of a number of processes on the gabinet.gov.pl portal, where nurses can prescribe independently.

The Foundation I set up invests more and more boldly in the digitization of nursing, supports the development of ICNP™, and has prepared courses for nurses, which will allow them to improve their competencies. They can teach other nurses about revolutionizing the world thanks to a better understanding of digitization, the importance of Big Data, mHealth and global eHealth.

The pandemic has also resulted in many political decisions that have lowered the standards of teaching and practice in nursing. Midwives without basic nursing education have been authorized to practice as nurses; previously such opportunities were given to paramedics. Access to the market has been facilitated for non-EU nurses, without the need to complete their education or even know the language. These are challenges for ensuring patients' safety. Unfortunately, we have lost our position of CEO Nurse in the government, and the Department of Nurses and Midwives was liquidated, which initiated a series of changes in the digitization of nursing. At the same time, patients more and more often use ICT solutions, which will also mean that nurses will be increasingly forced to participate in the galloping digitization of eHealth.



Submissions

Names

Pirkko Kouri & Teija Korhonen

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Organization

Savonia University of Applied Sciences

Titles

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STRATEGIES TO SUPPORT NURSES' AND MIDWIVES' MENTAL HEALTH DURING COVID-19

Background. Because of the pandemic, nurses and midwives (N&M) work in exceptional and extreme circumstances. N&Ms are especially vulnerable to experiencing mental health issues both in work and leisure time. Mental health challenges are related to increased workload, physical exhaustion and lack of leadership support. N&Ms take care of COVID-19 patients directly. Some N&Ms are transferred and are not working in their familiar area. Also, lack of personal protective equipment (PPE) causes greater risk for nosocomial transmission and moral injury. Mental health challenges appear in the following ways: tiredness, anxiety, insomnia, depression and stress.

It has been shown that preparing N&Ms properly for their jobs and the challenges associated with COVID-19 work reduces their risk for mental health problems. There is a need to build evidence based strategies to support N&Ms' mental health and to mitigate the effects of the pandemic on their health. The aim of this literature review was to present evidence-based strategies to support N&Ms' mental health and mitigate the effect of pandemic on their health. All types of articles between Jan 2019 and May 2020 were studied, and 23 articles were chosen for the final review.

Findings. We found four types of strategy levels to support N&Ms.

On the personal level, it is important to identify those N&Ms who are at greater risk and to understand factors causing their psychological distress.

N&Ms should be provided with personalized and tailored mental health interventions proactively to reduce their fears and uncertainty.

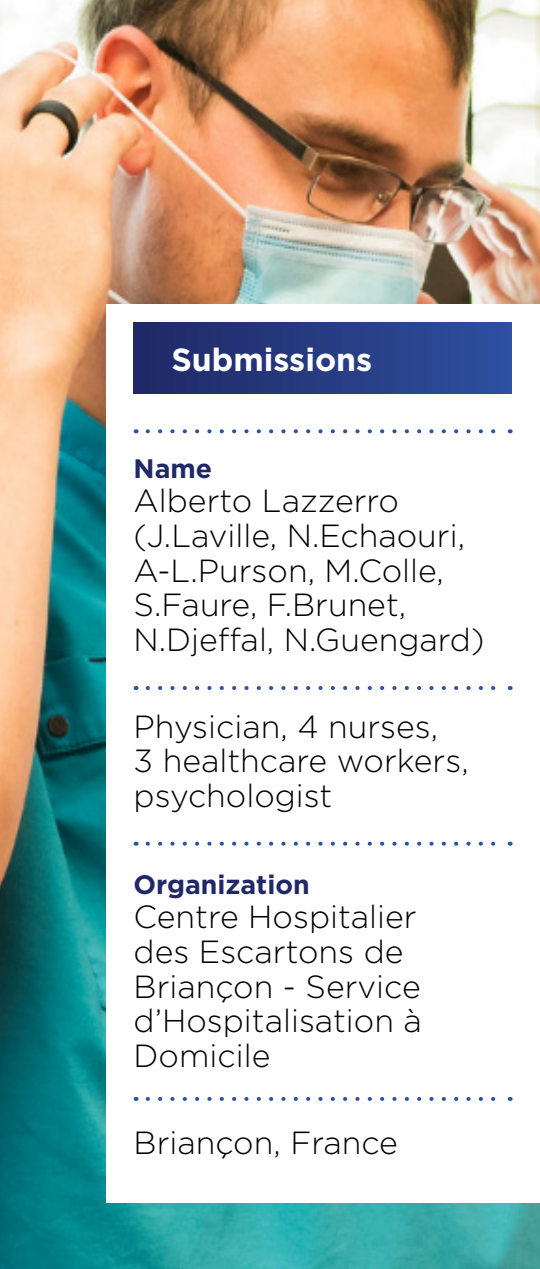
On the unit level, strong, people-oriented leadership is needed. This includes frequent and honest communication with nurses and midwives. Supportive strategies to prevent and control infections should be provided on the unit level.

On the organizational level, evidence-based plans for strengthening confidence, safety and coping of N&Ms have to be implemented. In practice, N&Ms need practical support such as sufficient PPE, reduction of work intensity, safe and quiet places to rest, and continuous training organized by the employer.

On the virtual communication level, there should be online support including hotline services for crises. Psycho-social education can be useful, e.g., via video calls, virtual meetings and chat. N&Ms need easy access to support services. Personalized support for mental health is important, to include access to multidisciplinary solutions, simulations and videos for interactive training, and patient and family education.

Conclusions. Despite the effects both of COVID-19 and more people receiving vaccinations, it is crucial to use personal, unit, organizational and multi-level support strategies to prevent or treat mental health challenges among N&Ms.

References are available from the authors.



Submissions

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Organization

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ADOPTION AND DEVELOPMENT OF TELEMEDICINE BRIANÇON'S HOME HOSPITALIZATION TEAM IN FRANCE

The period of the COVID-19 pandemic crisis that we went through in the spring of 2020 is a unique moment in the evolution of medical practices worldwide. The need to ensure continuity of care, in a context of essential physical distancing, has indeed led to a rise in telemedicine practices. Teleconsultation, in particular, has been widely deployed in France, with the implementation of several "exemptions" facilitating its dissemination.

Home hospitalization - Hospitalisation à domicile (HAD) - is a full-time hospitalization during which care is carried out at the person's home. The HAD system currently covers the entire national territory in France, and is now one of the responses to the growing aspiration of the population to be treated in their familiar environment.

Briançon is a small town in the Hautes-Alpes department in the Provence-Alpes-Côte d'Azur region in southeastern France situated at an altitude of 1,326 metres.

This geographical mountainous context is reflected in certain characteristics impacting access to healthcare for local populations:

- A low population density (25 inhab./km2) resulting in the isolation of populations that are complex to reach (60% of the population resides in a municipality of less than 5,000 inhabitants), especially in a context of declining medical demography.
- People aged 75 and over (11.9%) (9.6% in metropolitan France) and over 60s (32.4%) (26.9% in metropolitan France).
- Particularly high time distances to reach the hospital health centers, and these may fluctuate due to the state of the roads (snow, tourist traffic, etc.).
- Major tourist activity, generating flows of external populations by seasonal peaks, which can "saturate" the local health supply.

All this requires innovative solutions to practice medicine and nursing.

Briançon HAD is a small team consisting of 4 nurses, 3 healthcare workers, a coordinating doctor and a psychologist. The

team serves this community of about 20,000 inhabitants spread over 843,8 km2 in the territory of the Southern Alps near the border with Italy.

The confinement and the need for social distancing, to avoid unnecessary contacts at risk of contagion, has significantly increased the telemedicine activity.

The patients were able to receive alternatively home visits in person (for treatment and drugs delivery) with virtual visits by teleconsultation.

The focus of HAD's activity clearly revolves around the nurse.

The use of IT tools, such as communication platforms and connected devices, allowed a better coordination among different operators, and a constant connection among all the interveners, reducing the risk of error and delay.

Equally, the person of connection and reference for the patient and his family remained the nurse. Even on the occasion of face-to-face visits, the video connection made it possible to proceed in real time, with changes to the therapeutic plan and explanations to the patient and family with full involvement of all operators.

The pandemic context has given a boost to the adoption of these technologies in a systematic way in our team. The cohesion of this HAD team as well as the will to overcome the local-regional and geographical difficulties and the pandemic constituted a great opportunity for the development of digital healthcare and telemedicine in the southern alpine region.



Submissions

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Profession

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Organization

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Job Title

Telehealth

I am working remotely because I am a person at risk for COVID-19. Since the pandemic began in Peru, I have not traveled to the communities in San Benito de Cajamarca. I support my district remotely with the help of friends and medical doctors that I know well, so that they can have access to the hospitals and clinics and get oxygen as needed. I keep them informed remotely with a lot of emotional support for their families.

Several of my relatives have died from COVID-19.

At work, several colleagues have died.

Everything is saturated.

Today, vaccination has begun for the health professionals.

Here are some recommendations from my observations.

1. Maintain surveillance, detection and early management of COVID-19 cases, in addition to educating the population to achieve compliance with the recommendations of the authorities and experts, maintaining vaccination services in the first level centers of attention.
2. Carry out awareness campaigns about the importance of vaccines during and after a pandemic, since the temporary interruption of immunization services results in a higher probability of outbreaks which can cause more deaths and an increase in the incidence of burden on the health system.

3. Prioritize pneumococcal and influenza vaccination in high-risk groups as they are highly effective and reduce serious complications such as pneumonia. There are currently effective vaccines available for influenza, including the quadrivalent type.
4. Prioritize childhood vaccination with the incorporation of combined vaccines that allow for a more efficient immunization scheme. This could reduce medical visits and logistic needs and costs (warehouses, cold chains). In this way, vaccination coverage could be favored.
5. Ensure the purchase of sufficient vaccines and supplies to ensure the most vulnerable people do not suffer the consequences of not receiving the vaccines they need.





Submissions

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THE YEAR OF THE NURSE, 2020 - WHAT WAS IT ALL ABOUT?

It wasn't about the tasks, titles or travail. The accumulated professional rewards and retributions tucked neatly away to be pulled out when we needed to encourage the self, or validate the venial against the backdrop of a yawning healthcare system. Is this what we came here to do?

It wasn't about lives saved—though that's who we are and that's what we do. We did it beautifully as the principle dancers in a ballet choreographed with tears and triumph, regret and rejoicing, and ultimately, beginnings and endings. Is this what we came here to do?

It wasn't about our quick pivots and amazing ingenuity—though that too is who we are and what

we do. Interpreting an ever-changing kaleidoscope, narrowed in focus and blurred in color. The inside reality and the outside picture, blending into something that few can see and no one can name. Is this what we came here to do?

Each of us on our own journey but linked together. The daisy chain of private pain, personal sacrifice, public bravado. Each link dependent on the other as private lives and professional lives collided in ways we could neither imagine nor prepare for. Is this what we came here to do?

What did we come here to do? To change things. Each person-nurse dyad announces itself to the world as it starts a journey, and along the way lays claim to everything and anything necessary for them both to be whole, remain whole,

and help others on the same path. This is what we came here to do, this year and every year. We are neither saints nor martyrs—we're scientists, critical thinkers, engineers, inventors, listeners, conveners, advocates and more. Let us be that, without the hyperbole.

In his poem A Great Wagon, Rumi got it right. "Out beyond ideas of wrongdoing and right doing, there is a field. I'll meet you there." We just never dreamed it would be a Zoom room.



Submissions

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Organization

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Job Title

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As a PhD candidate, I was fully converted to the technological era suddenly in 2020 due to the global pandemic of COVID-19. When I conducted my first research of attitudes toward access to and use of IT among operating theater nurses in 2014, telehealth and involvement of Information and Communication Technology (ICT) was like a dream for nursing professionals and even most of them didn't have any idea about telenursing in Sri Lanka. However, last year, I learned that my research findings were important in 2020. At the time, most of the nurses showed positive attitudes toward ITC in the workplace. Now, I am involved in many online teleconferences and zoom meetings to prepare nursing practice guidelines for work using distance approaches

while the pandemic situation is decreasing their positive attitudes.

2020 was such an amazing year for telenursing. As a nurse practitioner, I learned to apply distance care approaches, like measurement of vital parameters through advanced technological instruments such as wearable body devices. Also, I learned how to use advanced telecommunication software that is useful for nurse, patient and physician collaboration and communication. It was a great achievement in my clinical practice journey.

Last year, all the conferences that I participated in were online. Even oral and poster presentations were conducted online. It was a first time life experience and my most enthusiastic event in year 2020.

As PhD student, all my courses converted to the online class in 2020. All the activities that I had to do used technology-based learning approaches such as preparing Google forms, writing assignments and conducting class presentations. Technology use became a habit in my student life. I feel that it is easier than in-person classes. No more paper, pen or pencil.

As a teaching assistant for a leadership and health policy course for PhD students, I automatically became a mentor in assisting with online lectures and group assignments for both in-person and online students. That was my biggest effort of

mentoring. The most difficult part to was to link online students and in-person students for their group activity.

In 2020, I was in Taiwan for my PhD. It was most changeable lifetime. I was a nurse practitioner who became an academic person then switched to technological learning processes that were more diverse than ever. This changed my whole life both academically and also personally because I needed a strong attitude to be successful during this big episode in my life.

The most important thing that I realized in 2020 was that education is an unending process in my life and I must have a strong commitment to it. It is not because of one's profession or level of education. It is one's passion for life. As a nurse, I can touch others' hearts by using advanced technology to feel their joy or sorrow. I can change my life most of all.



Submissions

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Name

Maria Pedro Miala

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Nurse

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.....
Organization

Tele-Saúde Educativo

.....
Job Title

Nurse and Founder of
Tele-Saúde Educativo

.....
Nijmegen, Netherlands

WHAT DID I LEARN ABOUT MYSELF AND MY INVOLVEMENT WITH TELEMEDICINE?

Saying that 2020 was a hard year is an understatement! When they asked me in March 2020 to go work in a unit with seniors who had COVID-19 I had to sit down and think about it since I have small children at home. The following months were exhausting: not being able to touch the children, not being able to see family members from Belgium for months, following strict rules of wearing protective materials during work hours, 6 to 7 deaths in a couple of weeks, and hoping not to get infected. Back in my birth country, many people were also dying, but it only hit me when I lost 3 members of my family in Angola. The family was devastated. Trying to console them from a distance with the help of social media and video calls was not enough.

Just like I helped and took care of patients with COVID-19 here in Europe, I wanted to be able to help people in Angola. But how? This is how my involvement with telehealth started. I founded Tele-Saúde Educativo.

<https://www.telessaudeeducativo.com/>

Tele-Saúde Educativo means 'Educational Telehealth'! It is a Nurse-Led platform, and we are here to educate and inform the people of Angola with the right health information. The goal is to offer them educational videos with creative and unique content about

COVID-19 and other diseases in Portuguese for the people at the pyramid base. What we are doing is providing tele-education about health, so people can have true and reliable information about COVID-19 and the precautions they should take.

But starting this organization from a distance while recruiting and working with Nurses in Angola was not easy at all. I am still struggling a bit, but we will get there. Our goal is actually to increase the knowledge of the people in Angola, promote self care and decrease the number of deaths caused by COVID-19. But we still have a long way to go. And just when 2021 was approaching and we were all full of hope again, we had a tremendous loss. A nurse in Angola died on the 31st of December. She never saw 2021! She was only in her twenties and she was a cardiac nurse who was happy to start working for Tele-Saúde Educativo and see the day of the launching.

We had too much loss in 2020! Being involved in telehealth is my way to contribute and I hope my contribution will help decrease at least a few deaths in Angola. So this whole situation has made me learn how resilient I am and that I can also make a difference in the world.

Submissions

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Organization

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Title

Assistant Professor of
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Since the arrival of the COVID-19 pandemic in India, nursing service has been under tremendous pressure to handle the hospital nursing services while balancing their personal and social lives.

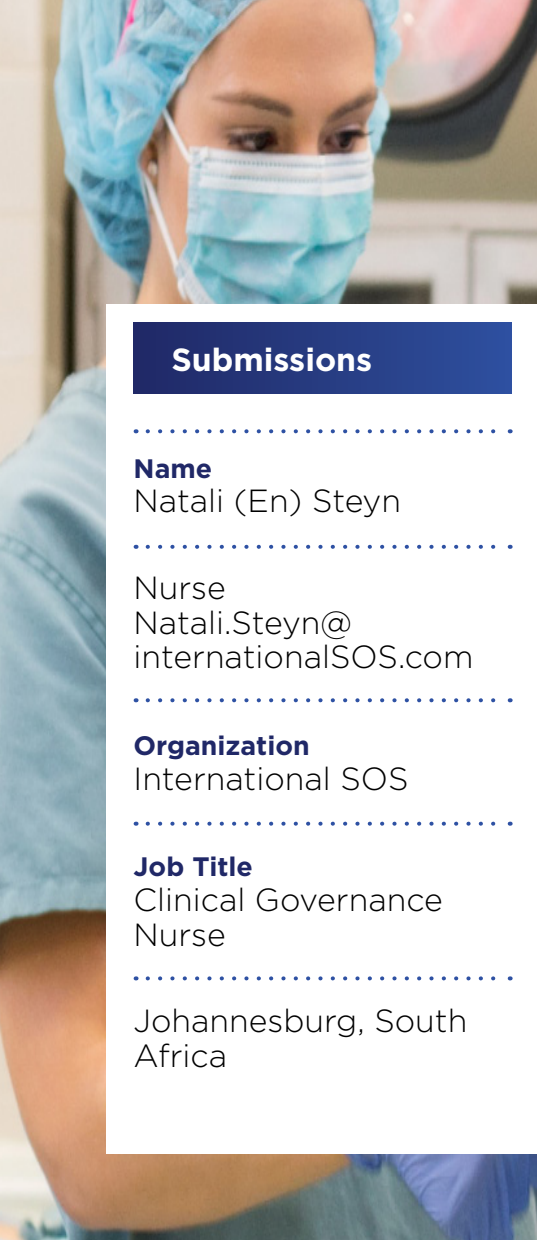
We at Mahatma Gandhi University Hospital were an approved COVID-19 testing and treatment center. We immediately responded to the pandemic situation with a skilled nursing workforce that could use digital health tools and techniques.

Nurses were trained to handle remote screening and triage COVID-19 patients, perform the initial teleconsultation, arrange tests, respond to COVID-19 queries, and follow-up the post discharge cases.

State and district authorities took note of how effectively telehealth consultations can be efficiently utilized in pandemic situations.

This resulted in more nurses in India taking roles and responsibilities in the specialty of nursing informatics.

This success story led our academic and governmental organizations to consider starting master's programs in nursing informatics in India.



Submissions

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Name

Natali (En) Steyn

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Organization

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Job Title

Clinical Governance
Nurse

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WHO YEAR OF THE NURSE 2020

Clinical Governance (CG) is best defined as “the framework through which an organization is accountable for continuously improving the quality of their services and safeguarding high standards of care by creating an environment in which excellence in health care will flourish.”

I am proud to be part of the team that ensures that the appropriate level of care is maintained, making a measurable difference in the well-being of our patients and remote site healthcare providers.

The CG process starts with a thorough induction and orientation of healthcare

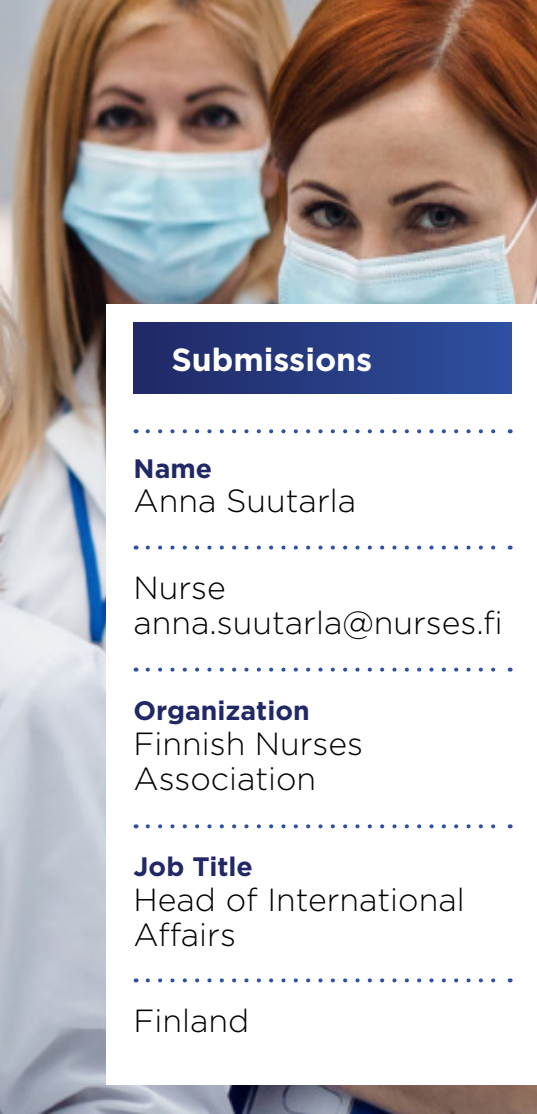
providers, but requires ongoing communication, feedback, teamwork and continued medical education (CME). When remote site healthcare providers work, they enter patient interactions and management into an electronic healthcare record (EHR) system. Anonymized patient electronic medical records are reviewed daily by the CG team to assess the quality of record keeping and medical management. Electronic peer-review, feedback and support is given to the healthcare provider within 24-48 hours of the patients' visits. An analytics system is used to identify patterns and trends in our region and identify cases that may require further follow-up or intervention. This system of continuous peer review and feedback, facilitated by real time analytics, has demonstrated significant and sustained improvement in patient care and staff satisfaction. In Sub-Saharan Africa, one of the biggest challenges is the management of malaria patients. Through the daily application of the system outlined we have observed significantly improved case management and staff engagement. Other examples of measurable improvements include the triage and care of emergency cases, antibiotic stewardship and the management of injury on duty cases.

I am not on the front line providing patient care, but it is very fulfilling to provide input on a vast number of medical cases and play a key role in supporting remote healthcare providers. We believe that through positive

reinforcement and daily feedback we can change behavior and practices and improve patient care. In the words of Atul Gawande “Better is possible. It does not take genius. It takes diligence. It takes moral clarity. It takes ingenuity. And above all, it takes a willingness to try.”

This could not be truer than during the current COVID-19 pandemic. The CG system has enabled us to not only provide medical advice and guidance, but also to provide psychological support for patients and healthcare providers. Working in a remote location with limited resources and not being able to see loved ones for extended periods has had a significant psychological impact on our staff and patients. Daily communication and feedback have proved to be of vital importance in ensuring staff remain updated, supported and motivated.

I believe that the future of similar CG programs and nurses' involvement is bright. eHealth tools such as EHR, telemedicine platforms and analytics tools have played a crucial role in supporting the continuity of care and promoting staff morale. The COVID-19 pandemic has acted as a catalyst, necessitating remote support of our colleagues, and ensuring the wellbeing of our patients.



Submissions

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Organization

Finnish Nurses
Association

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Job Title

Head of International
Affairs

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Finland

FINNISH NURSES ASSOCIATION GAVE AWARDS TO ITS MEMBERS DURING THE COVID-19 PANDEMIC

In the fall of 2020, the Finnish Nurses Association (FNA) opened a possibility to propose registered nurses (RN) who should be awarded by a financial recognition due to their exceptionally great performance during the pandemic. FNA received hundreds of proposals by the deadline. It was not possible to propose yourself, but the recipients of the recognition were selected based on the proposals from a colleague or a supervisor. The proposals' arguments had to reflect both a good attitude and collegiality.

The FNA Board had to consider whether to pay a larger amount

to only a few members of FNA who worked in exceptional circumstances during the coronavirus pandemic, or a slightly smaller amount to all of those who had been proposed. After reading all the proposals and their reasoning, the Board decided to make an award to all of its members who met the application criteria and had been nominated for the award. They were all awarded EUR 150.

It is quite obvious that nurses have done absolutely incredible quality work during the coronavirus pandemic. For many, their work description had suddenly changed. While clinical work mostly requires face-to-face contact, the pandemic has also encouraged increased and innovative use of telehealth solutions where applicable, e.g., with wound-care nurse consultations via video connection for the population at risk for COVID-19. The flood of proposals received by FNA sends an important message about the

unity of the profession and the appreciation of the colleagues within the nursing community.

Collegiality is more important these days than perhaps ever before. However, it is not enough to keep our health care functional. In the FNA surveys during the spring, summer, and fall of 2020, one thing came to the fore: RNs have had the experience of not being valued (1). More than 50% are now considering changing their profession. Almost one in three say they had even considered it before the pandemic (n=2344) (2). At the same time, Finland has the largest shortage of nurses of all occupational groups (3). Petitions made during recent months to pay an extra bonus for RNs during the pandemic have not been taken up by any political organization or other governmental body. It is crucial that all mechanisms of RN recruitment, retention and appropriate financial compensation be considered in these challenging times.

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3. TE offices of Finland, Occupational barometer 2020. Available in English at <https://www.ammattibarometri.fi/Toplista.asp?maakunta=suomi&vuosi=20ii&kieli=en>



Submissions

Name

Mary Jo Vetter

Nurse

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Organization

HealthSense, LLC

Job Title

Geriatric Primary Care Manager

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Over the past two decades I have advocated for nursing adoption of virtual care delivery. In my roles as nursing administrator, educator, and housecall clinician, I have persuaded my colleagues to integrate telehealth in practice by citing research evidence, quality improvement data, and cost analyses. I am the consummate telehealth champion, leading the charge by continuously sharing information about the incremental access to care and positive outcomes achievable with telehealth technology. As a consultant, I have empowered primary care practices with operational strategies to incorporate telehealth in emerging models of innovative nursing care delivery. As a geriatric primary care manager, I have used remote physiologic monitoring to facilitate clinical stability of my chronically ill patients and promote family involvement in the care plan. When the COVID-19 pandemic forced the discontinuation of face to face, home visits with my patients, I felt well-prepared to switch to virtual encounters to ensure continuity of care. What I did not expect was the receptivity to telehealth demonstrated by the home bound elders in my care. Together, we figured out strategies to continue the patient / provider bond we valued so deeply. I was humbled by the resilience and creativity I observed in caregivers, family, friends and neighbors as we all strived to maintain human contact. Without sophisticated technology platforms, we were able to communicate and proactively plan individualized

approaches to promote the ability to safely stay home. Our virtual visits, phone calls, text messages, and emails helped avoid exacerbation of illness that would normally necessitate a hospital admission or a visit to the emergency department where the risk of COVID-19 transmission was high. Under unprecedented circumstances, I witnessed the commitment to maintaining quality of life in spite of imposed stay at home orders. Though many were unfamiliar with everyday cellular technology, we persevered! As a result, telehealth has taken on new meaning in my nursing practice. I now view it as a lifeline that enables me to connect in ways that have enhanced my relationships with patients and the people who support them to age in place. I listen more, hearing nuances in conversations that were previously not heard, and focus more on the value of the interpersonal exchange than technology to inform the plan of care. As I continue to foster telehealth adoption in nursing, patient centered stories of the value of telehealth will be at the forefront of my efforts.

2020 RETROSPECTIVE: YEAR OF THE NURSE & MIDWIFE

PAPERS PUBLISHED BY NURSES AND MIDWIVES IN THE JOURNAL OF THE INTERNATIONAL SOCIETY FOR TELEMEDICINE AND EHEALTH, VOLUMES 1 THROUGH 8 (2013 - 2020)

Volume 8

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2020 RETROSPECTIVE: YEAR OF THE NURSE & MIDWIFE

WOMEN AND NURSING RESOURCES FROM THE WEOBSERVATORY



The Women Observatory for eHealth, or WeObservatory, is an Action Plan of the Millennia2025 Women & Innovation Foundation.

<https://www.m2025-weobservatory.org/>

The Millennia2025 “Women and Innovation” Foundation has been an institutional member of the ISfTeH since the creation and official Launch of the Women Observatory for eHealth (or WeObservatory) at **Medetel in Luxembourg, April 2013.**

As the co-founder of the **Working Group on Women (ISfTeH WoW)**, the WeObservatory with its partners have published three special issues on “Women in eHealth” of the Journal of the International Society of Telemedicine and eHealth (JISfTeH) in 2015, 2017 and 2018/2019.

<http://journals.ukzn.ac.za/index.php/JISfTeH/>

Also published in the JISfTeH are sixteen articles authored by women. (<http://www.m2025-weobservatory.org/journal-of-isfteh---wow.html>)

The abstracts of the 16 articles are translated in French in collaboration with WG Francophonie (https://www.isfteh.org/working_groups/category/francophonie).

WoW and Francophonie attend the annual conference Université eSanté in Castres, France (<https://www.universite-esante.com>).

The new special issue 2020 **“Telehealth in Nursing”** is published with one editorial and five articles authored by nurses and midwives.

JISFTEH SPECIAL THEME ISSUE: TELEHEALTH IN NURSING

GUEST EDITORIAL: Special Theme Nurses and Midwives in eHealth

<https://journals.ukzn.ac.za/index.php/JISfTeH/article/view/1500>

Claudia C Bartz, Pirkko Kouri, Veronique Thouvenot

Telehealth Nursing Research: Adding to the Evidence-base for Healthcare

<https://journals.ukzn.ac.za/index.php/JISfTeH/article/view/1449>

Claudia C Bartz

Developing a Cohort Web Application: Real-time Monitoring of Breastfeeding Indicators

<https://journals.ukzn.ac.za/index.php/JISfTeH/article/view/1450>

Maíra Domingues Bernardes Silva, João Aprígio Guerra de Almeida, Enirtes
Caetano Prates Melo, Vinicius Ramires Leite

Attitudes Toward Information Technology Among Operating Theatre Nurses in Sri Lanka

<https://journals.ukzn.ac.za/index.php/JISfTeH/article/view/1422>

Konara Mudiyansele Sriyani Padmalatha, Nishan Silva, Kithsiri Edirisinghe

Predicting the Future of Healthcare and eHealth with the Futures Wheel Method

<https://journals.ukzn.ac.za/index.php/JISfTeH/article/view/1464>

Pirkko Kouri, Hanna Hopia, Anne Hakala

Combating Malnutrition Among Pregnant Women, Mothers and Babies in the Rural Amazonian Forest: What can Telehealth Do?

<https://journals.ukzn.ac.za/index.php/JISfTeH/article/view/1409>

Rosa Liliana Macedo Ruiz, Angélica Baptista Silva, Ianê Germano de Andrade
Filha, Martha Inês Camargo Garzon, Waldeyde Oderilda dos Santos Magalhães,
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NURSES AND MIDWIVES IN EHEALTH

This Special Theme issue of the Journal of the International Society for Telemedicine and eHealth (JISfTeH) serves to recognise, support and advance the important role of nurses and midwives in eHealth and all of health care delivery.

The World Health Organization (WHO) has declared that 2020 is the 'Year of the Nurse and Midwife' to advance nurses' and midwives' vital position in transforming healthcare around the world.¹ As the largest group of health care workers in the world, nurses and midwives play a vital role in providing health services. These are the people who can exploit the digital health revolution to deliver care over rural distances and urban barriers, caring for basic health needs, chronic diseases and the effects of war and natural disasters. They are often the first and only point of care in their communities. The world needs 9 million more nurses and midwives if it is to achieve universal health coverage by 2030.²

The worldwide recognition of nursing and midwifery is timely, in that 2020 is the 200th anniversary of Florence Nightingale's birth. Nightingale's book, 'Notes on Nursing,' was published in 1859 and has been a beacon for nursing and midwifery ever since, with its topics such as taking food, light in the wards, cleanliness of rooms and walls, and observation of the sick.³ The observation chapter is one of the longest and we can perhaps glean some ties to the digital proliferation in health care today. For example, she wrote that nurses, and we include midwives, should be taught what to observe – how to observe – what symptoms indicate improvement – what the reverse – which are of importance and which are of none – which are evidence of neglect.³ Think of a chronically ill elder in her technology-supported home, or of a woman with a complicated pregnancy who is distant from care. Digital observation by providers is critical for appropriate and timely support and interventions.

ISfTeH – Your Global Partner in Digital Health – has, since its inception, been a strong supporter of nurses in all of their specialties. The Telenursing Working Group (TWG) was organized early in ISfTeH's history and continues to grow today, with more than 165 members representing 47 countries. The TWG's vision is to extend nurses' reach through technology and improve the quality of healthcare delivery worldwide. Its mission is to provide a forum for exchange of knowledge and experiences of nurses and others who are working with or supporting nurses using eHealth applications. Each year, one or two TWG-organized nursing webinars are hosted worldwide. The annual Med-e-Tel conferences included presentations and on-site global webinars by and for nurses. The annual international conferences co-sponsored by the sponsoring country's telehealth organization and ISfTeH also welcome nursing presentations. The newer annual meeting of ISfTeH, 'Digital Health Global Commons, powered by ISfTeH' continues to be an excellent venue for nursing and midwifery presentations and information sharing.

The Working group of Women (WoW) and the TWG are partners within the ISfTeH context, given that their goals are similar and of course nursing and midwifery are about 90 percent women. WoW develops actions to support and promote the role of Women in the areas of telemedicine and eHealth in the world. It aims to develop collaborations with other WGs, the Journal of the ISfTeH and international partners to make women visible in international conferences and scientific publications.

The idea for this Special Theme Nurses and Midwives in eHealth issue came from the outstanding accomplishments of the WoW leaders, who have published four Special Theme Women in eHealth collections in JISfTeH volumes 3, 5, 6 & 7 with corresponding printed monographs for each of the sets of papers.⁴ A call for abstracts was sent out widely to nurses and midwives in early Autumn of 2019^{5,6} and five papers were accepted by the organizers for submission to the

JISfTeH editors and review process. While nurses authored these five papers, we acknowledge the work of midwives found in the monographs noted above. For example, the editorial by Cadee and Ali described technology and care by midwives and briefly reviewed research that increases the knowledge and evidence for safe practice worldwide.⁷ The paper by Perez-Chavolla et al described six midwifery projects of the Women Observatory for eHealth with the aim of supporting the adoption of information and communication technologies in eight countries.⁸ And the paper by Pezaro described the development of an evidence and theory-based design of an online intervention to support midwives in work-related psychological stress.⁹

The five papers in this 2020 issue reflect a wide diversity of eHealth-based interests. The development of a cohort data capture interface using real-time monitoring of breast-feeding indicators for high fetal, neonatal and child risk from birth two years was described by Silva et al. The paper by Bartz looks at nurse-led research more comprehensively to identify and describe research-based evidence for use in clinical nursing practice and education. The papers by Heli et al and Padmalatha et al demonstrate how nurses are facing the constant in-flow of digital health technology and also what methods can be used to inform and

educate nurses to ease the constant change. Well-being technology approaches suggest new ways of using technology, gamification and computational intelligence in addressing the challenges. The paper by Kouri et al describes the Futures Wheel Method as one means by which people in health care can work to anticipate and articulate the future, both for digital technology in all of its health-related applications and for interpersonal communication skills and requirements.

We hope that the papers in this Special Theme Nurses and Midwives in eHealth issue, together with the previous Women in eHealth issues, will be an encouragement to all nurses and midwives to submit their research manuscripts to JISfTeH for review and publication. Guidelines for papers format and submission are on the journal's website (<https://journals.ukzn.ac.za/index.php/JISfTeH/issue/view/60>). If you are not already a member of the Telenursing Working Group or the Working group of Women, or both, please do join ISfTeH and at least one working group (<https://www.isfteh.org/>).

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TELEHEALTH NURSING RESEARCH: ADDING TO THE EVIDENCE-BASE FOR HEALTHCARE

ABSTRACT

This paper reviews recent, nurse-led telehealth research with the goal of describing research findings that provide evidence for practice. **Methods:** Using an iterative search method, of eight electronic databases, 84 nurse-led research papers were separated into intervention research, systematic reviews and meta-analyses, and descriptive research. The main emphasis was on full text analysis of the intervention research. **Results:** Fifteen intervention research papers reported findings related to cardiovascular disease, diabetes mellitus, older age, young adults, early adolescents, children with special health care needs, people with a stoma, post-partum mothers and nurses. Also reviewed for useable evidence for practice were 10 systematic reviews, two meta-analyses and two papers that described reviews plus meta-analyses. Fifty-five papers with descriptive designs are briefly described. Nurse-led intervention research is increasing knowledge about the use of telehealth technology and applications in care delivery. People with healthcare needs do better with individual attention and increased follow-up. People have a tolerance for technology used with them to advance their quality of life and healing but there is a point at which too much technology is overwhelming. Clinical research is a challenge due to the number of extraneous variables that are difficult to control and that can affect a person's response to the research intervention. **Conclusion:** Continuation of nurse-led telehealth intervention research will help to ensure that technology used to support and advance care delivery will be evidence-based.

Keywords: nursing; telehealth; intervention research; evidence-based practice; review

INTRODUCTION

More than 20 million nurses worldwide are involved in health professions and care delivery 24/7.¹ Nurses have been involved with telehealth technology and applications for decades; the telephone has always been used by nurses to educate, consult with, and support patients and families. Mobile phones and digital capability have extended the reach and scope of nurses for healthcare delivery. Successful nurses use the technology that most appropriately supports their practice. Nurses' roles in the development of research-based evidence for practice should not be overlooked. Those nurses who lead randomized controlled trials or other intervention research in the telehealth environment are a small fraction of all nurses worldwide. However, these role models show how nurses can be leaders in advancing evidence-based practice. Nursing, with its ethos of holistic caring, will use research to strengthen its impact on healthcare with a growing body of evidence based knowledge. This is all to the good for health and well-being of people worldwide.

Since late 2016, a constant search of the English language literature has been underway for telehealth research publications that have a nurse as first author. While nurses may be listed among the author group on some articles, or they may clearly have participated in the research interventions without direct attribution, by using the nurse-as-first-author criterion nurses can be given full credit for leading

the research team. Literature searches in 2016, 2017 and early 2018 found nurse-led research publications with predominantly descriptive designs that covered telehealth nursing, clinical practice, education and research.²⁻⁴ These demonstrated the depth and breadth of nursing in the telehealth environment. Of 51 papers identified in 2017 plus first quarter 2018, 38 used descriptive designs and 5 described technology (apps) evaluations. Eight papers used quasi experimental designs, resulting in some evidence for practice.⁴ The papers represented nurses from 19 countries.

The purpose of this paper is to discuss nurse-led telehealth research from 2018 through first quarter 2019, organising the papers by design: intervention research, systematic reviews and meta-analyses, and descriptive designs. The greatest emphasis will be on intervention research and resulting outcomes that can be used to support evidence-based practice. The goal of this work is to encourage more nurses to do intervention research, thus generating observable and measurable evidence for healthcare delivery.

METHODS

The design for this paper is a critical analysis of nurse-led intervention research, systematic reviews and meta-analyses, and a brief discussion of the descriptive research papers found during the study period. The literature searches supporting the prior and current work are iterative. A medical librarian regularly and repeatedly reviews dozens of tables of contents of health-related publications and then forwards to this author all telehealth research publications found in the ongoing reviews. This provides a steady flow of multidisciplinary papers involving telehealth, e.g., 357 papers in 2018. We recognise that this contrasts with traditional, one-time searches that use one or several search terms and inclusion criteria with databases such as PubMed, CINAHL, PsychINFO, EMBASE, Global Health, HealthStar, ISI Web of Science and Google. However, established databases are slow to add new journals and, with PubMed, to assign MeSH subject headings to new titles. Also, the headings for different databases may overlap or be different. Further, the terms and keywords used in telehealth articles vary a great deal, e.g., tele- (specialty), eHealth, mHealth, mobile health, digital health, artificial intelligence. And, databases that use automatic term mapping make searches more difficult as the search terms are identified wherever they are in the article, making a more detailed manual search necessary after all.

RESULTS

In all of 2018 through first quarter-2019, 84 nurse-led research papers from 21 countries were identified. (Table 1) Fifteen papers described intervention research, ranging from intervention-control studies to randomized controlled trials. Fourteen papers described systematic reviews and/or meta-analyses and 55 papers used descriptive research designs.

“.....
Nurses’ role in the development of research-based evidence for practice should not be overlooked
.....”



TABLE 1. Papers by country.

Australia	3	Netherlands	1
Brazil	2	New Zealand	2
Canada	5	Norway	1
China	5	Singapore	1
Denmark	1	South Korea	2
Finland	2	Spain	2
Greece	1	Sweden	4
Hong Kong	1	Switzerland	1
Iran	2	Taiwan	2
Italy	2	United Kingdom	2
		United States	42

Intervention Research

The 15 full-text papers were organized by research target group to lead current and future nurse researchers to their areas of interest. Research participants were as follows: those with cardiovascular disease,⁵⁻⁹ diabetes mellitus,^{10,11} older age;^{12,13} those who were young adults,¹⁴ early adolescents,¹⁵ children with special health care needs,¹⁶ people with a stoma,¹⁷ post-partum mothers,¹⁸ and nursing students.¹⁹ Ten studies used power analysis to guide their participant recruitment.^{5-8,10,13,15-18} Each paper's aim(s) and findings are briefly summarised. The papers themselves must be consulted for detailed methods, care delivery or replication.

The study by Abbasi et al⁵ used a non-randomized controlled clinical trial with 111 subjects. Their aim was to compare the effects of the self-management education program using a multi-method approach or multimedia approach on the quality of life among patients with chronic heart failure. Findings were that the multi-method approach and multi-media approach groups had statistically significantly improved total quality of life (QOL) and knowledge compared with the control group. The multi-method approach was statistically significantly more effective than multimedia in terms of increasing QOL and self-efficacy in the knowledge domain.

Dadosky et al⁶ used a prospective nonrandomised trial design comparing a historical control group that had received standard care with a prospective intervention group receiving standard care plus tele-management. Their aim was to investigate whether tele-management of heart failure patients throughout the post-acute continuum of care would reduce rehospitalization rates and improve patient self-care knowledge and satisfaction. Patients who were re-admitted within the tele-management group had significantly higher cardiac ejection fractions and

significantly higher Center for Outcomes Research Evaluation scores predicting rehospitalization risk compared with the historical group. Clinically significant findings were noted for risk reduction in time to intervention for the tele-management group.

Ghezeljeh et al⁷ completed a randomized clinical trial with control group among people with hypertension (HTN). The aim was to compare the effects of self management (SM) education using telephone follow-up and smartphone-based social networking follow-up on SM behaviours among patients with HTN. Six weeks after the intervention, there were statistically significant findings. Participants in the telephone and smartphone social networking follow-up groups had statistically significant differences in SM behaviors compared to the control group and the group without follow-up. The telephone and smartphone social networking groups were not significantly different in the effectiveness of the SM education.

Mols et al⁸ used a single-center, prospective, randomized controlled design to assess the 30-day impact of a nurse-led telephone follow-up performed 2 to 5 days after same-day discharge following percutaneous coronary intervention pathways. No differences were found between the groups in terms of adherence to platelet inhibitors or aspirin regimens. The portion of patients readmitted, the self-initiated contacts to general practitioners and the knowledge of how to manage symptoms of angina were all significantly lower in the intervention group when compared to the control group. Carrying out healthy physical activity was significantly higher in the intervention group.

Ni et al⁹ used an exploratory randomized controlled trial to evaluate the feasibility of using mHealth (WeChat and BB Reminder) as a tool to assist people with coronary heart disease to take their cardio-protective medications. While medication adherence increased at the 30-day follow-up for both groups, the intervention group had a greater increase but these changes were not significant. Changes in blood pressure were not significantly different but heart rate significantly decreased at 30 days in the control group.

Two intervention studies targeted people with diabetes. The study by Kotsani et al¹⁰ used a randomized controlled design to evaluate the efficacy of telenursing on the frequency of glucose measurements and the improvement of blood glucose variation in young type 1 diabetic adults (age 18-39). The researchers found a significant improvement in the glucose concentrations in the management group in month 1; the mean morning glucose concentration in month 3 were also

significantly lower in the intervention group. In month 2 the difference was not significant. Also, the pre-prandial glucose concentration were significantly lower in the control group than the intervention group in months 1 and 3. The changes in HbA1c were not significant.

Mott et al¹¹ reported a study of adults with type 2 diabetes undergoing a surgical intervention. The aim of the study was to develop, implement and evaluate a nurse-led telehealth preoperative intervention to improve glycaemic control prior to surgery. On the day of surgery, a fasting glucose was drawn; there were no significant differences between the usual care group and the telephone intervention group. An interesting finding was that 4 of the 25 participants in the intervention group decided to postpone their surgery, possibly because the education and knowledge from the phone call made them realise their glycaemic control should be improved before a surgical procedure.

Two intervention studies involving older people were found. Bakas et al¹² used a quasi-experimental design to test the feasibility of a new program, the Telehealth Community Health Assistance Team (T-Chat), a nurse-led intervention delivered through a telepresence robot designed to promote chronic disease self-management and healthy independent living among older adults. The primary outcome of the study was unhealthy days based on 2 items in the post-intervention interview and data collection. Depressive symptoms, other symptoms (e.g., fatigue, pain, stress, sleep), aerobic activity, cognitive ability and quality of life were also measured. Trends in positive directions could be seen in the data. For example, the T-CHAT group, in comparison with the wait list control group showed medium to large improvements in unhealthy days and there was a moderate improvement in depressive symptoms favoring the T-CHAT group.

The aim of the quasi-experimental study by Santana et al¹³ was to compare the effectiveness of telephone versus conventional follow-up in post-surgical older adult patients. The study hypothesis was that the intervention would improve patients' autonomy for self-care and surgical recovery. Findings were that the patients in the control group showed significantly increased time for surgical recovery and patients in the intervention group had significantly less impaired mobility, need for assistance for self-care, fatigue and time required for recuperation.

Côté et al¹⁴ used an experimental design to evaluate the efficacy of a web-based tailored intervention with the aim of reducing cannabis use among young people (18-24 years) by promoting a more positive

intention to abstain. Findings were that a higher proportion of participants in the experimental group reduced their cannabis use compared with the control group. There was also a significant intention in the experimental group to abstain over time and intention increased significantly in the experimental group but stayed stable for the control group.

Parisod et al¹⁵ used a single-blinded, 3-armed cluster randomized trial to study tobacco-related health literacy among early adolescents (10-13 years). The study aim was to determine the short term effectiveness of the tobacco-related mobile health game **Fume** and a non-gamified website in comparison with a no-intervention control group. No statistical significance was found in anti-smoking self efficacy between the groups after the intervention nor were there differences in the five other outcome variables: smoking outcome expectations, attitudes towards tobacco use, motives to use tobacco, motivation to decline tobacco in the future, and knowledge about tobacco. However, the health game group visited **Fume** significantly more frequently than the early adolescents on the website group and **Fume** raised more interest than the website. The authors noted that self-efficacy scores among the early adolescents were high already at baseline and may have hindered favourable results, statistically.

Hooshmand and Foronda¹⁶ used a prospective, quasi-experimental design to examine cost, caring, and family-centred care (FCC) from the family perspective in relationship to paediatric specialty services integrating telemedicine (TM) visits compared to traditional face-to-face visits for children with special care needs (CHSCN) in rural, remote and medically underserved areas. There was no difference between the groups on the perception of the care their CHSCN received or their perception of healthcare providers as caring. Significant differences between groups were found on perception of the system of care as family-centred between the traditional and telemedicine groups, with the TM group having significantly higher scores on all six facets of the FCC measure. Costs were not significantly different between groups except if the CHSCN needed care by specialists who were not in the local clinic; then the costs for the traditional care group were significantly higher.

Wang et al¹⁷ used a randomized controlled trial to assess the effectiveness of the follow-up care enhanced with a home care mobile app on the psycho social adjustment, self-efficacy and stoma-related complications of discharged from hospital patients with stomas. Findings were that both groups had improved psycho social adjustment over time but the intervention group had significantly greater

increase in improvement in psycho social adjustment at 1, 3, and 6-months over the control group. Similarly, the intervention group had significantly higher stoma self-efficacy than the control group at 1, 3 and 6-months after discharge. The intervention group had a lower incidence rate of stoma complications but the differences were not statistically significant.

Harris-Luna and Badr¹⁸ used a pragmatic research design to evaluate the effectiveness of a breastfeeding telephone support intervention delivered by **promotoras** (lay healthcare workers) to increase exclusive breast feeding (EBF) rates among Hispanic women at 12 weeks after birth. A pragmatic trial was described as taking place in the setting where individuals already receive their usual clinical care with trained research staff responsible for recruitment and data collection to maximize applicability and generalizability. Findings were that at 12 weeks after birth, significantly more women in the intervention group than control group were continuing EBF. Perceived breastfeeding support, lower household income, **promotora** breastfeeding telephone support and higher self-efficacy scores all significantly predicted breastfeeding at 12 weeks after birth.

Liu et al¹⁹ used a retrospective, historical control group design to evaluate the effectiveness of platform-based emergency department (ED) training of nurses compared with the same nurses who received their continuing education program in conventional classroom settings during the prior year. The number of nurses completing the training significantly increased over the previous year (from 60% to 100%) and the examination scores were also significantly improved in the intervention group.

Systematic Reviews and Meta-analyses

Fourteen reviews (systematic or integrative) and meta-analyses were found in this literature review: 10 systematic/integrative,²⁰⁻²⁹ two meta-analyses,^{30,31} and two combined.^{32,33} Traditional search methods were used with hundreds, if not thousands, of citations first found, with a range of 66³¹ to 14,292.³² Years covered by the searches ranged from 1²⁴ to 28,³² with two papers^{26,30} noting 'inception to' or 'up to' (current year) and two papers^{23,31} not noting the range in years. The papers evaluated by the 14 studies ranged from 5 (of 185)²⁹ to 70 (of 3622).²¹

Topics addressed in these papers were cardiovascular disease,^{27,29,32,33} cancer,^{23,31} chronic disease,^{21,25} chronic obstructive pulmonary disease,³⁰ teledermoscopy,²⁰ follow-up after discharge,²⁸ nurses,²² apps for quality improvement,²⁴ and physical activity in elders.²⁶

A study by Jin et al³² reported a significant finding, that being telehealth significantly improved cardiovascular risk factors. Rush et al²⁵ reported virtual education delivered to patients with chronic diseases was comparable or more effective than usual care. More commonly, authors noted that the studies showed lack of homogeneity,^{21,22,31} methodological inconsistencies or limitations,²³ variable quality,^{24,29,33} lack of studies,²⁶ or limited evidence.^{20,27,28,30}

Descriptive Research

Of the 55 descriptive research papers, 28 reported studies of availability, acceptability, perceptions, and attitudes of the study targets (patients, people in various age groups, people with various diseases, caregivers in the home or community, and nurses). This set consisted of 12 papers targeting people with diseases or conditions.³⁴⁻⁴⁵ Seven papers looked at nurses or nursing students.⁴⁶⁻⁵² Four papers were about maternal-child issues.⁵³⁻⁵⁶ Three papers looked at elders or home care,⁵⁷⁻⁵⁹ and two papers looked at care in limited resource settings.^{60,61}

The second largest set (11) described studies of apps or mHealth applications used for a particular treatment need. Four papers dealt with cardiovascular issues.⁶²⁻⁶⁵ Three papers were in oncology settings.⁶⁶⁻⁶⁸ The last four papers addressed single topics: post-operative monitoring,⁶⁹ e-outpatient visits,⁷⁰ parenting,⁷¹ and eICU.⁷²

Six studies described development, testing and evaluation of apps for care delivery.⁷³⁻⁷⁸ Four studies described the use of modelling or other predictive strategies for assessing risks or outcomes.⁷⁹⁻⁸² Four studies described the use of digital learning, simulation or social media for learning and communication among nurses,⁸³⁻⁸⁶ and two papers addressed telehealth policy and standards.^{87,88}

DISCUSSION

The studies found with this literature review show many areas of interest among telehealth nurses. The topics indicate that nurses want to know more about the who, what, when, why and how of integrating telehealth applications into care delivery and education.

Evidence-based knowledge can be drawn from the results of the intervention studies. Patients or people with healthcare needs do better with individual attention and longer than usual follow-up using phones or mHealth applications.^{7,8,10,13,17,18} However, people may be overwhelmed with too

much technology given to them at one time.⁵ Phone or mHealth follow-up can be a useful adjunct to traditional education for self-management of chronic disease.⁷ Nurse-learners preferred mixed methods. Self-directed online learning was not seen as sufficient and may not have accurately reflected the learner's participation.¹⁹ On the other hand, a web-based tailored intervention reduced cannabis use among 18 to 24-year-olds and increased their intention to abstain over time.¹⁴ And, early adolescents (10-13-year-olds) are willing to participate in education with gaming and digital education applications for tobacco-related health literacy.¹⁵ Cost of care is a consideration; parents with local access to specialty care via telehealth for their children perceive their care as better.¹⁶

Clinical research, and thus evidence accumulation, is a challenge, given countless extraneous variables that can affect the person's response to an intervention.^{6,11,12} Historic data used as a study's control may lack reliability due to missing or unusable data.⁶ Adequate sample size and study duration, attentive management of the control group, and minimal study complexity are essential to successful research.^{11,12} Pre-programming and automating mHealth applications could facilitate scaling up the sample size and study duration.⁹

What can be learned from the 14 systematic reviews and meta-analyses? The answer, unfortunately, is 'not much.' It may be that systematic reviews and meta-analyses would be best used to bring together all that is known about a specialty or setting. This endeavor could include anecdotal reports, editorials, opinion pieces, economic analyses, quality and process improvement reports, education program descriptions, historical information and research reports. Until research itself becomes more program-driven with consistent terminology, measurement tools, interventions and reporting templates, large research reviews are not contributing to the evidence base for practice. The World Health Organization is making a commitment to bringing the digital era to healthcare worldwide and looks to structured systems for data collection, aggregation and analysis. Its MAPS toolkit is one example: mHealth assessment and planning for scale.⁸⁹

Descriptive research findings can establish a basic foundation for programs of research that can continue toward controlled trials to build knowledge and advance practice. Descriptive studies can also help nurses new to research to learn the process and understand the benefits, barriers and challenges of achieving reliable methods and producing valid results. Most telehealth nursing research involves

human beings. Researchers would most likely agree that human subjects' research is difficult due to concern for ethical treatment of the subjects and also to the countless extraneous variables that can diminish the goodness of research results. That said, it is important, if not imperative, that nurse-led research uses intervention studies that generate reliable and valid evidence for practice.

One limitation of this paper is that only English language papers were reviewed. More nurse-led telehealth research has surely been published in other languages. A second limitation is the way that authors are identified in publications; if only the author's name or name plus practice environment are listed some nurse-led research may have been missed.

The main recommendation drawn from this work is that telehealth nurse researchers must continue to lead intervention studies with large, randomized controlled designs wherein, insofar as possible, all extraneous variables are controlled. With telehealth technology and applications rapidly transforming from optional nice-to-have technologies and applications to being integrated with the healthcare infrastructure,⁹⁰ nurses know that evidence-based telehealth applications are essential to the capacity of care delivery and quality of care outcomes for people with health needs, their families and their communities.

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DEVELOPING A COHORT WEB APPLICATION: REAL-TIME MONITORING OF BREASTFEEDING INDICATORS

ABSTRACT

Investing in the development of methodologies for timely intervention in breastfeeding practices that provide improved indicators and prolong breastfeeding duration positively impacts the health of women and children.

Aim: To develop children cohort data capture interface of a national reference institution for high fetal, neonatal and child risk from birth, covering all hospitalization up to the second year of life for real-time monitoring of breastfeeding indicators and prevalence.

Methods: Four primary criteria were considered: data security (specific permissions for different profiles and encryption of sensitive data), researcher time streamlining, data quality and construction of data export auxiliary tools. **Results:** A web-based tool for data collection using a mobile device or computer was developed. The tool successfully allowed the ongoing collection for a defined population cohort of measures related to breastfeeding: maternal factors, child-related factors, health service issues, pacifier use, introduction of fluids and other processed foods, as well as breastfeeding practice. **Conclusion:** The developed product enables the validated extraction and collation of data from existing electronic records and other sources for the monitoring of breastfeeding practices. Such data can be used to refine guidelines and individual behavior to maximize the benefits of breastfeeding and avoid early weaning.

Keywords: telehealth; web application; nursing; breastfeeding; cohort; Brazil

INTRODUCTION

Breastfeeding brings short, medium, and long term benefits, and is considered an investment for the future by promoting the health of women and children, thereby supporting human capital development and economic return for the nation.¹ Improved breastfeeding rates can impact the morbidity and mortality of mothers and children, potentially save the lives of over 800,000 children and 20,000 women worldwide annually.² Thus, the investment in the development of methodologies that allow prompt intervention in breastfeeding behavior, to ensure a higher prevalence and longer duration would be valuable and positively impact the health of women and children.

Monitoring and assessment are some of the components of the National Policy for the Promotion, Protection and Support of Breastfeeding (BF) in Brazil, aimed at following-up the status of national BF indicators and Policy-related interventions, as well as encouraging and supporting related research.³ The latest national prevalence survey was conducted over 10 years ago, and cross-sectional data are limited to the sixth month only.⁴

The monitoring of BF indicators in Brazil is the responsibility of the health facility (hospital, primary health unit, and maternity hospitals).³ To date, Brazil has not invested in establishing strategies that allow near-time follow-up and monitoring of the child's feeding practice for the first two years of life, especially for the first six months, during which time exclusive BF is recommended for all children.⁵

Therefore, a study was designed to investigate the prevalence and duration of breastfeeding and their relationship with determinants in the first two years

of life. A cohort of children born at the National Institute of Women, Children and Adolescents Health Fernandes Figueira (IFF/FIOCRUZ) was followed. This national reference institution for fetal, neonatal, and child high risk was chosen because of its vocation for teaching and research, its level of excellence, and the volume of annual records of hospital visits, admissions, and newborn profiles with significant variability in risk exposures. The IFF/FIOCRUZ is equipped with a Human Milk Bank, and it is a National Referral Center for the Brazilian Network of Human Milk Banks and a Global Referral Center for 23 cooperating countries.

A major goal of this longitudinal study was to maintain data continuity and avoid participant dropout and associated data losses, albeit temporary. To minimize this, a combination of monitoring strategies, directly and indirectly related to obtaining information for the study,⁶ and proper follow-up of participants were employed to ensure sufficient and reliable information to identify and classify incident outcomes of interest.⁷

Given the need to collect and manage large volumes of data in a prospective longitudinal study on breastfeeding, and the enormous challenge of preventing follow-up losses, we considered the development of a tool that would allow cohort follow-up. It was anticipated that this would serve as a monitoring prototype for the institution, with the potential to be applied in state reference centers throughout the national human milk bank network.

Thus, this study describes the development of a web-based application that facilitates the capture of data from a study cohort, and allows near-time monitoring of breastfeeding indicators, its prevalence, and duration. The data include fetal, neonatal and child risk information from birth, covering all hospitalization up to the second year of life.

METHODS

This applied research involved the development of a web application for data capture of breastfeeding practice on a mobile device or computer. The application was initially developed a doctoral thesis⁸ with a proposal for later implementation at a reference service.

The platform was developed by the participation of four experts. Collectively the experts (nurse, paediatrician, Human Milk Bank Network (Rede

Brasileira de Bancos de Leite Humano; rBLH) coordinator, and epidemiologist) had recognized experience in the area of breastfeeding, human milk, and epidemiology. The team reviewed the proposed technological solution, critiquing the approach to facilitating participant adherence over time, to improve the questionnaire, and to assess the relevance and appropriateness of the questions against the proposed objective.



Improved
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Three steps were required to build the software: i) data entry structuring, ii) computational application building, and iii) pre-test application, and pilot study to adjust application execution problems.

Data entry structuring. The application was structured into five questionnaires related to the theme, as per the forms created especially for this study, i) the participants' profile characterization questionnaire (newborns and their mothers; with baseline information on prenatal care, childbirth and immediate postpartum care; related to the child, health service use and breastfeeding); ii) follow-up questionnaire for each hospitalization (information regarding participants, health service used, pacifier use, and feeding practice record); iii) questionnaire for first consultation after hospital discharge (information regarding mother, child, pacifier use and breastfeeding); iv) the monthly follow-up up to six months (information regarding mother, child, pacifier use, readmission and breastfeeding); and (v) early weaning questionnaire. Details about participants, setting, and procedures have been published elsewhere.⁹

Computational application building. A responsive web application was developed using a Bootstrap framework.¹⁰ This is a serverless architecture where the application incorporates third-party “Backend as a Service” (BaaS Firebase)¹¹ services and includes custom code run in managed, ephemeral containers on a “Functions as a Service” (FaaS) platform.¹²

Pre-test application and pilot study. To adjust the application’s data capture interface a pilot of the

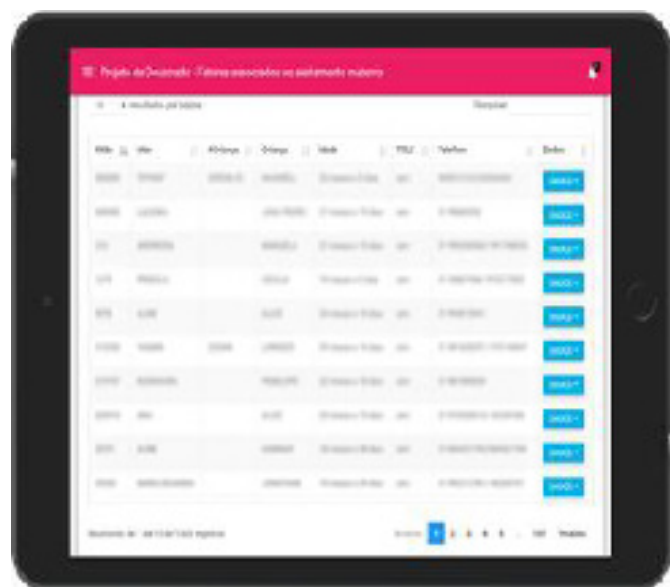


FIGURE 1 (A).
Main page with access to all newborn forms.

data collection instrument was performed with 20 volunteer nursing mothers with a social and functional profile similar to the target population.

After the pilot study, a three-stage data capture process was implemented for the study. Data were captured for a birth cohort of all children born in the institution between March 2017 to October 2018, excluding those with contraindications to breastfeeding (HIV, HTLV, inability to feed themselves orally, and incompatibility with life).⁹ The first stage occurred in the maternity ward with individual interviews and data extraction from medical records. In the second stage, the mothers were interviewed during the first consultation after hospital discharge. In the third stage, telephone interviews were conducted at each month of the child’s life (up to six months, and then at 24 months of life) to obtain information about the children’s feeding practice. The application was used at all stages of follow-up by a previously trained team (leading researcher and research assistant staff).

RESULTS

A web-based tool was developed for data collection using a mobile device or computer. The tool is an organized breastfeeding monitoring system for mothers and their children up to two years of age. Identification and assessment forms (based on three main pillars: security, quality, and low-cost infrastructure (web server)) are provided to capture



FIGURE 1 (B)
Application Screenshot: Admission Form.

data for each health system encounter. It has been using Bootstrap and Firebase Progressive Web Application technologies to support non-relational data storage and application hosting.

During development, the demands of different collection stages and departments (maternity, neonatal and neurosurgical intensive care units, neonatal care follow-up outpatient clinics and the Human Milk Bank) were considered. The platform was designed to be, flexible, to facilitate input from these multiple data sources (data extraction from medical records, plus face-to-face interaction and telephone interviews with mothers). Interviews were conducted using the application to gather information from the mothers of 1,003 newborn cohorts.

At each data collection point, several attempts were made to contact the participating mothers, thus ensuring follow-up contacts within the specified time frame in order to avoid follow-up losses and secure adherence and bonding with the research team. The application’s home screen (Figure 1a)

informs when each child completes a month, and year of birthday.

The data collected were imbalanced, and 75 mothers (7.5%) were lost to follow-up,⁹ which ensured internal validity for this longitudinal study. Proper follow-up of participants is necessary to ensure that sufficient and reliable information is obtained for the identification and classification of incident outcomes of interest in the study.^{6,7}

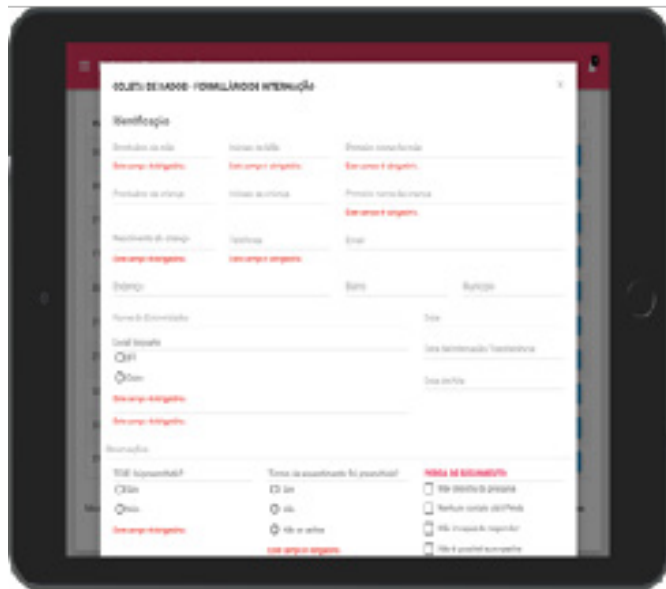


FIGURE 1 (C). Validation and required fields.

The tool was demonstrated to be successful in several aspects, based upon the experience of the leading researcher and research assistant staff as implementers and users. For example, the tool enabled the monitoring of all low and high-risk children in the cohort for up to two years of age, providing insight in 'near time' of the prevalence of breastfeeding and breastfeeding practices, supporting timely intervention to prevent premature discontinuation of breastfeeding. In addition, use of the tool was found to be intuitive, being easy to understand and fill out for any trained professional, and facilitated data collection and minimised loss to follow-up by highlighting the best time to conduct telephone interviews with mothers. It also ensured confidentiality through different levels of user access authorisation. Finally, reports of data-based information could be compiled and exported in interchangeable formats for different statistical software, always respecting the arrangement of rows and columns. This feature allowed, for example, ongoing near time estimate of the prevalence

of breastfeeding; functions as a complementary strategy in maintaining cohort adherence; allows automatic recording of data between screens; and favors the streamlining of different times (completion, data processing, typing, linking, face-to-face interviewing and time of researchers and women in the various data capture contexts).

When recruiting a mother and their newborn for follow-up, the admission form was completed

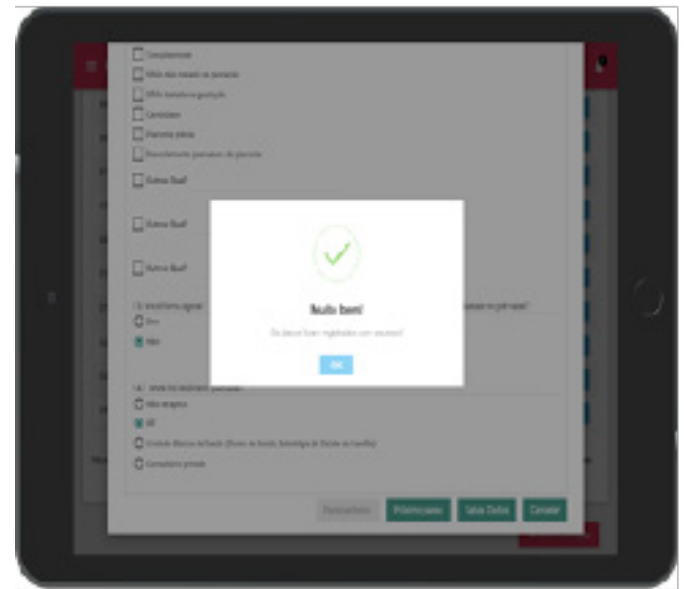


FIGURE 1 (D). Automatic saving of data in the passage for each question block.

(Figure 1-b) with questions on identification, date of birth, date of admission and discharge, address, and telephone number. In this screen, the nurse/researcher entered answers from the different blocks of questions regarding maternal factors, factors related to the child, the health service, the use of nipples or industrialized liquid foods, and breastfeeding habits. The transition between screens allowed automatic saving. The application had a feature that automatically recorded the interview date and participant identification with a key code, allowing simultaneous collection of data from different sources by more than one research assistant. In addition, the data were structured and stored non-relationally, allowing constant development of the form and permitting quick action for any necessary changes in the follow-up of children. By establishing 'required fields' (Figure 1c) the system prevented advancing forward before completing the field. A red alert showed the need to answer the question before proceeding to the next block. This measure formed a part of the quality

control process. In addition, the reason for loss to follow-up could be recorded (bottom right, Figure 1c), choosing from: mother gave up on the research, no contact made up to 6 months, mother unable to answer, or not possible to follow-up.

After completing any form, it was necessary to press the SAVE key to store the responses in the database (Figure 1d). Each new interview involved selecting a new form that automatically became available. Viewing spreadsheets and reports required exporting of the stored data, as described earlier.

DISCUSSION

This study describes the successful development and application of a tool by which to monitor breastfeeding performance and habits of mothers and their newborns and illustrates the main benefits of the application. As a monitoring tool, the developed system supports tracking of feeding practice from birth to two years of a child's life. The benefits included: adherence to protocols for data collection, guaranteeing confidentiality and security levels; timely data capture; flexibility to use on different electronic devices; use of different data sources; adherence to protocols for data collection, and supporting quality data collection and analysis. The application facilitated near time knowledge of breastfeeding indicators, and thereby timely interventions to prevent early interruption of breastfeeding. Further investments are required to encourage monitoring of breastfeeding indicators in other spheres.

Increasingly mobile device apps are being used for health research, service delivery, and public health surveillance through aiding community data collection.¹³ Studies have shown fewer errors when collecting data using questionnaires on mobile devices versus paper.^{6,14} As a surveillance system the tool identifies breast feeding related sentinel events impacting mothers and newborn quality of care. Although there were no studies on the development of this type of data collection application in this

context,¹⁵ the creation and computerization of this meaningfully supports breastfeeding follow-up and, especially, allows timely interventions, to discourage premature interruption of exclusive breastfeeding.

The product uses serverless technologies that remove the burden of infrastructure, and accelerate the development process by allowing time to create the leanest data collection forms and create field versions. Computerized data collection can also reduce human errors during data entry, contributing to better data quality and increased credibility of survey results.¹⁶ One improvement proposed by the team involves the creation of an alert system to issue notification from the beginning of the follow-up contact period until the end of this period.

This study is one of the few on the development of this kind of application for data capture and monitoring of health indicators, especially breastfeeding in Latin America, and one of the first to develop an organized system for monitoring breastfeeding and its determinants in Brazil.

The main limitations of the application are its Internet dependence and lack of integration with the institution's medical records system. The use of the application is limited to the hospital context by the need to check information regarding hospitalisations.

CONCLUSION

The breastfeeding monitoring application offers more rapid insight regarding current breastfeeding habits, and is important to allow meaningful, accurate, and timely planning of short-term actions to improve breastfeeding outcomes. The architecture of this technological solution proved to be effective and efficient in managing high volume data from different sources, in ensuring quality and security during all stages, and in offering expected functionalities for prospective observational studies and is an essential contribution as an organized system for monitoring breastfeeding from birth to up to two years of age.



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Ethics approval and consent to participate:

This original study was approved by the Ethics Committees at IFF/FIOCRUZ, Brazil (Protocol Number: 1.930.996 - 2017). Written consent of participation was obtained from eligible participants after they were provided with an information sheet.

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ATTITUDES TOWARD INFORMATION TECHNOLOGY AMONG OPERATING THEATRE NURSES IN SRI LANKA

ABSTRACT

Incorporating the use of information and communication technologies (ICT) into everyday professional practice requires nurses to overcome resistance to change and to become willing users and creative operators of IT. Managing the change process effectively while implementing eHealth (e.g., Hospital Information Systems) within the operating theater environment can facilitate the efficient delivery of quality patient care. **Aim:** To describe the uses of and attitudes toward current IT by operating theater nurses at The National Hospital of Sri Lanka

(NHSL). **Methods:** The research used a descriptive design and survey method. The study population was theater nurses working in 16 theaters. A convenience sample of 112 nurses selected from the 16 theaters was used. Nurses with a service period over 20 years were excluded. Data were gathered with a self-administered questionnaire.

Results: The response rate was 97 of 112 (87%). The study found that nurses were highly confident in using computers, touch screens, the Internet and email. Almost 80% of theater nurses used computer technology for their work and personal matters. However only 60% of the nurses had personal email addresses. Furthermore, 79% of nurses believed that computers would reduce paper work. **Conclusion:** Most operating theater nurses possess a positive attitude toward advances that use IT applications. This may be due to the growing presence and accessibility of IT in their work environment, which has added value

in their day to day practice in the hospital. To facilitate ongoing growth in use of IT in Sri Lanka, continuing education opportunities for operating theater and other nurses should be pursued.

Keywords: nurses; ehealth; information and communication technology; education; operating theater nursing; Sri Lanka

INTRODUCTION

Over the last decade, information technology (IT) has experienced an extraordinary rate of development. IT has brought significant change in the perceptions, attitudes and ways of thinking of its users,^{1,2} made many aspects of life,^{2,3} and necessitated organizations to adopt IT to remain competitive.⁴ However, use of IT in healthcare settings has also had negative impacts on care delivery systems. For example, while

IT overcomes the problem of distance between healthcare provider and patient, it also means that there are no hands on interaction between doctor/nurse and patient.⁵ IT may extend quality of life and socioeconomic status as well.⁶ Adoption of new IT systems requires skilled staff and positive attitudes to the new technology.⁷ Wilbright et al⁸ found that nurses lacked sufficient computer literacy, work -related computer skills and proficiency with basic Windows' functions.

Sri Lanka had no national IT-based healthcare system until 2011, although some healthcare institutions had previously adopted digital solutions of their own accord.⁹ The Ministry of Health of Sri Lanka established the Health Information Unit of the Management Development and Planning Unit (MDPU) as the focal point for eHealth activities.¹⁰ There are currently no large-scale eHealth projects implemented in Sri Lanka, but

the MDPU is poised to implement some IT-based information system initiatives in healthcare settings within the next few years.¹¹ However, there has been no nursing research into IT in healthcare, and a gap in knowledge exists around, for example, the use and attitudes of operating theater nurses in Sri Lanka toward computer technology. This study fills this knowledge gap, and also explores the interest of nurses in participating in IT based activities in nursing care settings for future benefits.

“.....
IT has brought significant change in the perceptions, attitudes and ways of thinking of its users
.....”

METHODS

This study used a descriptive research design and a survey to assess the use of IT by operating theater nurses, and describe their attitudes toward present and future use of IT. It was carried out with operating theater nurses of the National Hospital of Sri Lanka (NHSL). This hospital is the largest hospital and final referral center in the country and has about 3,500 beds. It is the only national level hospital, and supports most specialties; for example, there are 31 specialty clinics (surgical, medical, cardiothoracic, ear-nose and throat), but no paediatric clinics. It has 16 operating theaters, with 358 nurses working in the operating theaters. These nurses were graded according to their work experience: Grade 11-B (0-5 years of work experience), Grade 11-A (6-10 years' work experience), Grade 1 (11-15 years of work experience), and Super Grade (15-20 years of work experience).

Those with between 0 and 20 years of experience could volunteer to participate in the study. Nurses with over 20 years of work experience were excluded as they were nearing retirement and were not expected to be working with the new IT-based systems). Nurses who were on medical / long-term leave during the data collection period were also excluded. Both Sinhalese and Tamil nurses were included. A convenience sample of 112 operating theater nurses (seven nurses from each of the 16 theaters) were approached to participate without regard for duty or shift hours.

A self-administered questionnaire was designed based on the reviewed literature and prior research.⁴ . The survey had 9 closed-ended questions and one open-ended question. One question had 7-parts, and used a five point Likert scale to ask about nurses' attitudes toward, access to, and use of IT Another question asked about the meaning of IT; the Oxford Dictionary definition was used as the reference definition - “the study or use of electronic equipment, especially computers, for storing, accessing, analyzing and sending information”.¹² Because both Sinhalese and Tamil nurses were fluent in English, the questionnaire was provided only in English.

The questionnaire was reviewed by two research supervisors at the International Institute of Health Sciences Sri Lanka for face and content validity, and pre-tested by 10 government sector nurses enrolled in the Open University of Malaysia Bachelor of Nursing degree program.

Although the questionnaire was self-administered, the researcher was present in person during data collection allowing immediate response to any questions in accordance with a pre-prepared protocol that provided explanation for each question. The survey data were collected from 20 March to 15 April 2014. The researcher handed the questionnaire to each of 112 nurses (7 from each theater), personally meeting them after duty hours to minimize disturbance to the nurse's work and patient care. The procedure was explained to them and their consent was sought and received.

This study was approved by the Institutional Review Board of the National Hospital of Sri Lanka Informed and written consent was obtained from all participants.

Descriptive statistics were used to summarize data and to compute the frequency, percentage, mean, mode and median values of different variables in the data using Microsoft Excel. Categorical variables were described using frequencies and proportions.

Confidence Items	Very confident	Confident	A little confident	Not confident	Don't know	Have no experience with IT	No response
Items	14	48	24	3	1	5	2
Computer	20	43	23	3	1	4	3
Mouse	20	41	21	5	1	6	3
Touch screen	17	46	20	7	1	3	3
Internet	17	41	17	11	1	7	3
Email	17	41	17	11	1	7	3

TABLE 1. Confidence of respondents in the use of ICT.

RESULTS

The response rate was 87% (97 of 112) as 15 respondents did not complete all questions. Forty-nine nurses (51%) were grade 11-B, 40 (41%) were grade 11-A, 3 (3%) were grade 1 and 5 (5%) were in the super grade category.

Confidence in use of information technology

The confidence of theater nurses in using a variety of IT hardware and software applications ranged from Very Confident to Not Confident. Some respondents selected Don't Know or No Experience, did not respond. (Table 1)

Attitude of nurses to IT use

In response to a need for training in the use of different IT applications tools and software, responses ranged from 34 nurses wanting more training in use of the Internet to 39 wanting more training in the use of email. (Figure 1)

Most of nurses either 'agreed' or 'strongly agreed' that it is essential for a nurse to learn about using IT applications. When responses were displayed by years of employment, there was little difference across groups. (Figure 2)

Most respondents also agreed that IT applications made their jobs easier, although more 'agreed' than 'strongly agreed'. (Table 2) Also, nurses with 10 or fewer years of work experience were more in agreement than nurses with 11 to 20 years.

The responses of nurses on learning about and using IT applications in the workplace were quite positive. The question about using computers whenever possible was reverse coded. There were also generally positive responses to various actual or potential benefits of IT applications. (Table 3) Between 6 and 16 respondents chose not to answer the items.

Access to Information Technology

Seventy-six respondents indicated they used a computer for work related activities or personal use or both. (Table 4) Nurses with between 3 and 5 years of work experience gave the highest positive response to this question. Thirteen respondents between 2 and 15 years of experience did not use computers and three respondents said they had 'no idea'.

On the question of email use, 59 (61%) respondents had email access and personal email addresses. (Table 5) Those

nurses with 3 to 5 years of employment were most likely to have email addresses. About half of the nurses with less than 2 and between 6 and 15 years of employment had email. Almost all nurses with 16 to 20 years of experience had email.

The questionnaire included one item that asked for respondents' opinions on the statement "Information technology will improve multi-disciplinary communication." Only 20 nurses agreed with the statement and years of experience did not make a difference. The view that IT will benefit the care environment where the clinical working practice relies on a collaborative, multidisciplinary interaction was agreed by 5 nurses.

DISCUSSION

The study evaluated the use of, access to, and attitudes of operating theater nurses toward IT in the National Hospital of Sri Lanka. A survey examined the nurses' preparedness for the sort of IT-based work environments found in the developed world. Some countries, for example Australia with its rapidly developing digital healthcare services, have recognized this as a high priority.^{4,13}

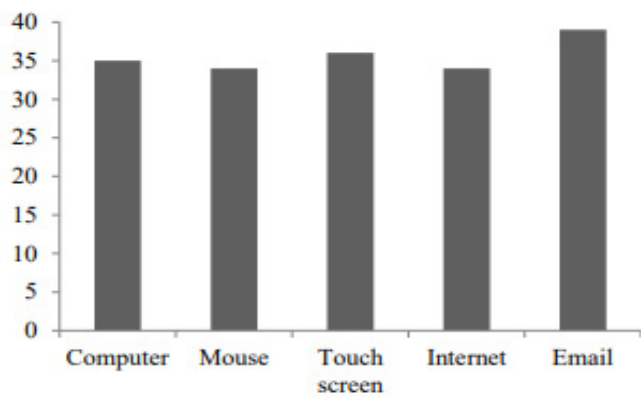


FIGURE 1. Number of nurses wanting training in IT applications.

The results of the study demonstrated important factors for the use of information technology by operating theater nurses in Sri Lanka. The survey was long, but the high response rate (87%) suggests this topic is one which is very important to nurses. The results of this study can be used as reference material for governmental policy makers or researchers to initiate future IT base activities.

The study found a confident attitude among most staff toward basic IT applications. Given that previous studies have shown increased computer experience relates to positive attitudes,^{13,14} it may be that familiarity of operating theater nurses with touch screen monitors and other technology facilitated this confident response. Experience and confidence in other tools and applications were not limited for the most part to more senior personnel. Low use, experience and confidence in IT were seen most in senior nurses and nurses with less than 2 years' experience. Greater use and confidence were seen among nurses with greater than 2 years' experience.

An interesting finding was that the nurses were reluctant to discuss multi-disciplinary communication

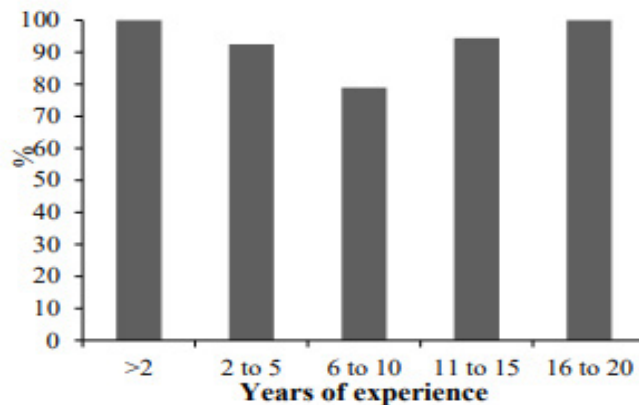


FIGURE 2. Percentage of respondents agreeing that learning about IT is essential.

that could be improved based on IT in the workplace. This contrasts with a study in Finland that noted nurses believe that computerised information improves multi-disciplinary communication.¹⁵

The Government of Sri Lanka continues with health system improvements, including the implementation of eHealth innovations, which cannot be achieved without the readiness of healthcare providers. Findings from this study could form the basis for developing the structure and composition of assessment tools to determine the readiness of nurses and other healthcare providers to participate in ehealth innovations in the workplace. Further research to understand the views of senior nurses regarding IT may also be needed. This group is responsible for the efficiency and effectiveness of care delivery, and for decisions about the operating theater functions, and their attitudes toward and knowledge about ehealth will be critical for success. As the largest cohort of healthcare professionals, nurses represent an influential group. Raising their awareness, ability, and readiness to integrate ehealth innovations would be valuable.

Work Experience in years	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	No response
0-2	3	1	0	1	3	0
3-5	7	25	3	1	0	5
6-10	2	13	0	0	0	4
11-15	4	13	1	0	0	0
16-20	5	4	0	0	0	1

TABLE 2. Opinions on the statement “The use of IT in my workplace has made my job easier”.

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	No response
Avoid using computers whenever possible	7	23	4	37	14	12
Learning about computers is essential	46	43	1	1	0	6
Use of IT reduces error	19	48	8	8	2	12
Use of IT reduces duplication	10	55	6	9	1	16
Use of IT makes life easier	22	55	5	2	3	10
Use of IT improves information access	25	58	2	1	0	11
Computers will reduce paper- work	25	51	4	6	0	11

TABLE 3. Responses about the use and benefits of IT applications.

Limitations

A convenience sample was used in the study reducing generalizability of the results and opening the possibility for sampling error because respondents may have been more interested in IT than those who chose not to participate. There may have been discussions about the questionnaire among participants, but this was not controlled for. The study was in only one institution which could limit its applicability to other institutions.

Recommendations

Professional, ongoing training programs are necessary to support nurses in understanding and using IT to its maximum effect. Schools of nursing could consider integrating content about informatics and digital applications into their curricula and providing continuing professional development programs. The government is encouraged to continue advancing eHealth programs and IT applications in Sri Lanka.

CONCLUSION

This study of attitudes toward access to and use of IT has shown that operating theater nurses have a basic understanding and positive attitude toward IT in the workplace. Operating theater nurses at the National Hospital of Sri Lanka are prepared to embrace IT advancements in their work environment. Consequently, the IT and larger eHealth upgrades that have been proposed by the government of Sri Lanka could be initiated in the National Hospital's operating theatre section before broader implementation.

Work Experience (y)	Yes	No	No idea	No response
0-2	7	0	1	0
3-5	32	5	2	0
6-10	12	5	0	2
11-15	14	3	1	0
16-20	11	0	0	0

TABLE 4. Use of computer for work or personal activities.

Work Experience	Yes
>2	20
3-5	26
6-10	7
11-15	1
16-20	5

TABLE 5. Nurses who have personal e-mail accounts categorised according to work experience.

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PREDICTING THE FUTURE OF HEALTHCARE AND EHEALTH WITH THE FUTURES WHEEL METHOD

ABSTRACT

By using information and communication technology (ICT), eHealth is a key enabler in improving healthcare, specifically its efficiency, productivity, quality, and patient satisfaction. Whilst eHealth applies technical developments to healthcare services, it is also about managing, finding, using, recording, and transmitting information to support health-related decisions. Moreover, eHealth encompasses a broad approach and commitment to improving healthcare through networking and co-operation. Thus healthcare providers need to have sufficient tools to predict and involve the possible futures of healthcare, specifically in the context of continuous eHealth development, implementation and innovations. This paper introduces the Futures Wheel (FW) method, describes the process for its use and some of its outcomes as a tool by which to achieve these goals. Based on experiences from over 60 FW working groups, the authors suggest that the FW method helps to see the possible futures of healthcare and eases the necessary adaptation inherent in eHealth. The FW method provides information and knowledge that professionals can utilize both to influence their future and to gain knowledge about alternative futures. The FW method is suggested for healthcare professionals who want to predict alternative futures of healthcare and eHealth in order to make important decisions that may have far-reaching consequences.

Keywords: eHealth; healthcare trends; Futures Wheel (FW) method; futures work; predicting the future

INTRODUCTION

Futures studies, or futurology, is an increasingly mainstream social science approach that uses a variety of methods to systematically aggregate and analyze trends to examine what is 'likely to continue and what could plausibly change' in order to forecast possible futures. The future studies method has proved to be an excellent method for concretising co-operation in working life and for systematically collecting information on the future of working life. The method provides an overview of current and anticipated trends and the skills that people will require to optimally use and benefit from these. The development of innovative and up-to-date learning requires new ways of working, tools and learning environments. Learning can therefore be considered anticipation, so anticipation skills and future thinking must be the starting point of development work and part of all learning.^{1,2} One of the aims of futures studies in the context of healthcare is to systematically explore both possible and desirable futures and to improve decisions made by practitioners, managers, leaders, educators, policy makers and clients/patients.³ By examining different development paths, futures studies can describe multiple scenarios such as current and new styles of ehealthcare processes and effects of digitalization and help inform perceptions, alternatives and choices about the future.⁴ Indeed, healthcare providers need futures research to offer them a vision for their future work and work environments. Although the future is unpredictable, alternative futures, scenarios and possibilities can be described and anticipated.

There are few methods which help healthcare providers to predict alternative futures for healthcare, particularly in the area of eHealth innovations and implementation.

Technology is an integral part of health science, with constant change and advancement. However, human factors will be one of the durable limitations of breakthroughs, and needed when anticipating future.⁵ It has been suggested that medicine and technology are entering an era called 'ITicine',⁶ showing the deep liaison between use of digitized technology, such as "caring machines," by patients/clients and healthcare professionals, also termed digital therapeutics (software driven, evidence-based, ICT to prevent, manage, or treat a disease or disorder).⁷ Caring machines refers to persons who cure themselves with the help of machines supported by ubiquitous computing.⁸ In Nordic countries, 'ITicine' healthcare is moving toward more patient-centric care, enhancing patients' participation in the healthcare process.⁶ Healthcare professionals could benefit from sharing their perspectives and views with others concerning futures work⁶ requiring tools to help them anticipate and understand future changes and their implications.

The Futures Wheel method involves group discussion to build a vision of an agreed theme. It has been applied in different professional fields and disciplines, and some research has been published in the context of healthcare and healthcare education. For example, the method was applied to discover critical futures utilising a so-called "Think Tank" program.^{9,10} With the help of an experienced facilitator, the participants questioned existing culture and manners and determined future healthcare scenarios. The method provided information about actions needed to build a preferred future over the next two decades. The actions defined were adoption of new technologies,

better information collection and management, training and education programs, and, most importantly, attitudinal and cultural change. Futures methods have also supported the development of a regional plan to improve health outcomes and to make present health services more dynamic.¹¹ In workshops, participants described existing reality and then constructed a future of healthcare. The desired future was delineated in tight strategic alliances, education, inspiring technology usage, and taking better care of both older and younger people.¹¹ The futures method was also used to describe the perceptions of Finnish master's students (social services and healthcare) about their future work and the competencies they will need in the future. The participants learned futures thinking which would, optimistically, be used in their studies and jobs.¹²

The purpose of this paper is to give insight into one Futures Studies method, the Futures Wheel. Although there are several alternative approaches to designing and conducting the Futures Wheel (FW) method,¹²⁻¹⁴ multiple steps for one way to use the FW method in the healthcare context are presented, together with recognition of the strengths and limitations of the method. Between 2014 and 2018 the authors organized and conducted over 60 Futures Wheel workshops with groups from various professional fields. Some of these sessions focused on staff working in the fields of social services and healthcare. The approach taken to the process of presenting and analyzing a session forms the basis for the paper.

Futures Wheel Method

Glenn^{13,14} developed the Futures Wheel (FW) method in the 1970s as a structured brainstorming method used for thinking about the future. It is a group work method in which the potential impacts on the future

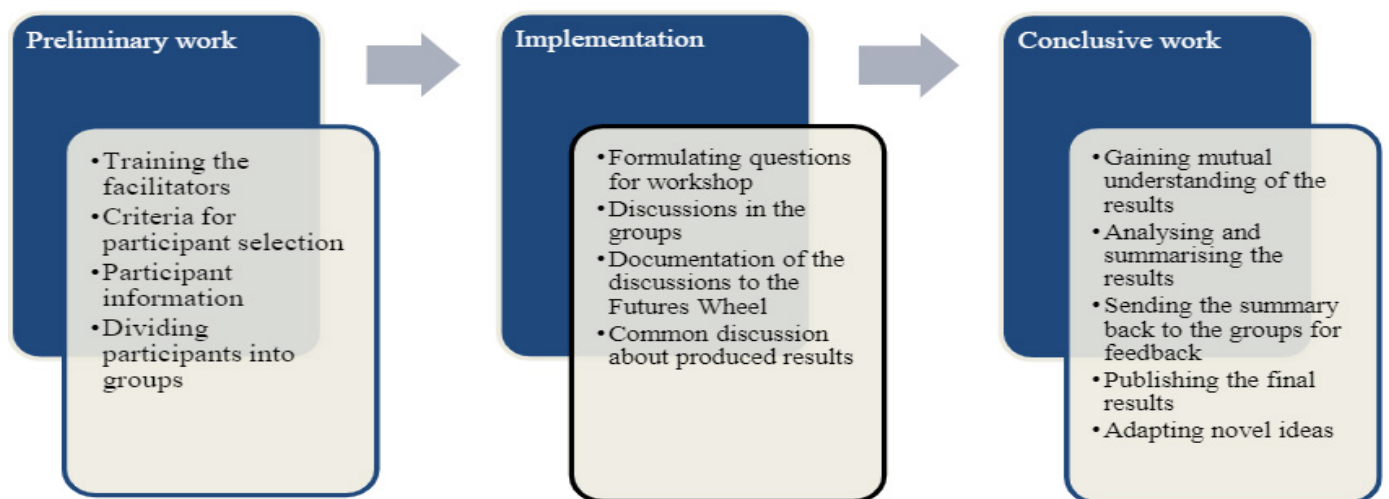


FIGURE 1. The Futures Wheel method.

are arranged in circles around a wheel. According to Jackson¹⁵ the FW method produces a graphical visualization of the direct and indirect consequences of a change or development, thereby encouraging participants to 'think outside the box'. The wheel organizes participants' answers surrounding questions that go from strategic to operational. The questions are written in the middle of a piece of paper, and then small spokes are drawn wheel-like from the center. Thus, the FW workshops function as tools for data collection and enhance learning and innovation among participants.¹²⁻¹⁴ In our workshops, we used an application created by Glenn.^{13,14} The process is presented in Figure 1, and key steps are further described below.

Preliminary work - Training the Facilitators

Each workshop had a facilitator who was responsible for coordinating the Futures Wheel workshop and leading the group discussion. Their role was crucial in creating an innovative atmosphere for producing different possibilities of the future of healthcare and eHealth, and they were responsible for training participants to think about recent developments and potential future developments.

Although Glenn^{13,14} argued that successful facilitation required certain considerations, there was a limited description of the role and tasks of the facilitator who would be expected to guide participants in considering plausible futures and trends associated with healthcare and especially with the phenomenon of eHealth. Glenn noted that the facilitator would be a person who is familiar with thinking about the future and the Futures Wheel method and would use the guidelines of the method to help and lead participants in reflecting on the future regarding a specific content area. The facilitator would need to remain objective and neutral and would not take a particular position in the discussion. They would be responsible for assisting the group to achieve consensus on any disagreements that emerged during the workshop. Hence, the facilitator needed to know their own position(s) from the outset and guard against bias or conflicts of interest.¹⁶⁻¹⁸ Throughout the process, the facilitator had to keep the discussion focused on the future. These necessary skills, and the preferences and characteristics of the participants, were carefully considered prior to choosing the facilitator.

Implementation – Formulating Questions for the Workshop

Although many factors influence the future, weak signals or small changes at different levels can yield significant changes overall. Researchers have anticipated, identified and illustrated healthcare and

education trends.¹⁹⁻²² In preparation for the Futures Wheel workshops the facilitators first studied research literature from different sources describing megatrends.²⁰⁻²² Healthcare megatrends that are likely to occur during the 21st century were identified as these will shape the sector for the next 10-15 years. Prior to the start of workshops, the trend options were selected, while recognising that local, regional and national changes are constantly altering the healthcare landscape.^{12,21}

After discussion by the facilitators, consensus was reached on a set of megatrends that would be used in the workshop. These were the polarization, internationalisation, and digitalization of healthcare services; aging; and ecological soundness/sustainable development. These megatrends were used to stimulate different perspectives from participants. Recognizing that the use of these megatrend labels might prevent the participants from considering other future scenarios, a "wildcard option" was also used in the workshop. The idea of the wildcard option was to inspire additional views on the future that went beyond the selected megatrends. According to Mohamed,²³ uncertainty phenomena are defined as randomness with unknowable probabilities. The wildcard option allowed for uncertainty phenomena. A blank sheet of paper was given to the participants along with the five megatrends.

Based on the discussions and consensus on the megatrends, the facilitators then determined specific questions associated with the goals of the workshops. Three rounds of questions were used to achieve the goals. The questions were as follows: 1) What will the healthcare sector be like in 2025 and thereafter? 2) What new competencies would be required for the realization of the future of healthcare and eHealth, given the identified megatrends? 3) How will the competencies be acquired? In the workshop, futures were considered for 2025 and thereafter.

Implementation: Facilitating Discussions and Documenting Discussion in the Future Wheel

The Futures Wheel method was described to the workshop participants and included descriptions of where the alternative futures produced by participants would be used.

The participants were asked to consider how the previously identified megatrends would affect the work in their field in 2025 and beyond. The selected five megatrends (polarization, internationalization, digitalization of healthcare services, aging, and ecological soundness/sustainable development) were introduced to the participants. After a thorough

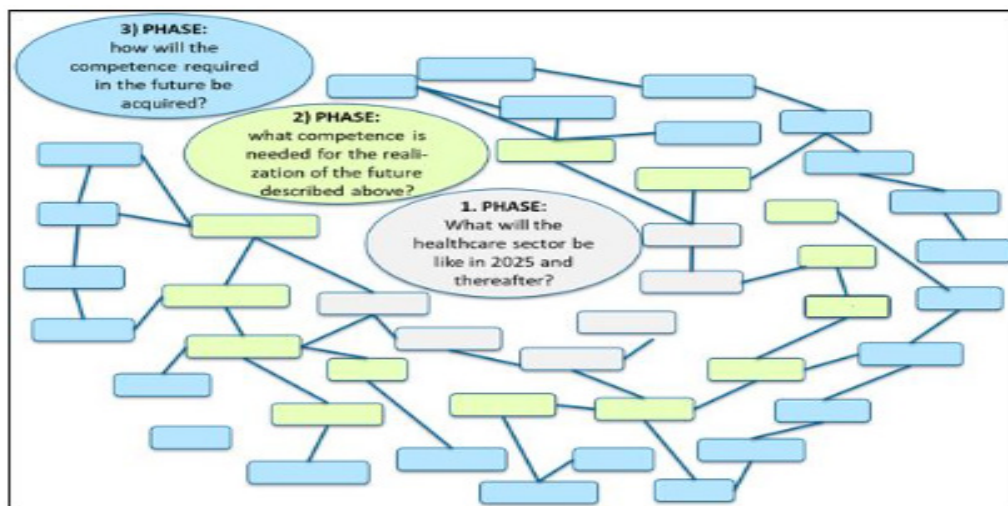


FIGURE 2. Futures Wheel method and circles.

discussion among participants, they wrote their views and perceptions on the papers, which were then arranged by facilitators in the first circle of a Futures Wheel diagram. (Figure 2) The participants were asked to consider the competencies required of professionals in their own field for the realization of the future described. After the group discussion, the competence descriptions were grouped in the second circle of the FW. The methods through which the requisite competencies would be acquired were then grouped in the third circle of the FW. Thus, the FW comprised three different circles using different colours to separate the circles. When all of the views were collected, the output was appraised by the group, and duplications were removed from the circles. With the help of facilitators, all participants then carried out an analysis of the views in order to gain mutual understanding. Reaching consensus by the end of the process is crucial. The participants needed to be committed to finding consensus so that everyone involved could actively support, or at least live with, the outcomes.

Strengths and limitations of the Futures Wheel Method

The Futures Wheel method encourages the participants to transition from linear, hierarchical, and simplistic thinking to more network-oriented, organic, and complex thinking. The healthcare system covers different services (e.g., primary, secondary, and tertiary levels), facilities (e.g., hospitals, out-patient clinics, nursing homes, assisted living locations), and people (e.g., families, clients/patients and providers) that interact according to plan, sometimes non-regularly, and sometimes in an *ad hoc* manner. All of these elements in motion can cause unintended consequences such as adverse drug reactions or nosocomial infections. The unforeseen consequences

raise the question of how regulations can be created to control the behavior of a complex healthcare system in order not to deviate from a desired outcome.²⁴ The FW method can encourage an individual to develop a prospective perspective and response toward a future event, such as competence demands or client/patient expectations for care in the future. The FW method helps to organise thinking and questioning about the future.^{13,14}

Although Glenn¹³ claimed that the Futures Wheel method promotes a rapid, grass-roots consideration of the future, it is still necessary to discuss the soundness and trustworthiness of its outcomes. Two steps were taken to ensure the accuracy of the results. First, the whole procedure was carefully designed with the facilitators to create common rules and practices concerning the guidance of the workshop and the documentation of the views of the participants in different circles on the wheel. Indeed, Glenn^{13,14} recommended strictly following the guidelines of the FW method to prevent chaotic “intellectual spaghetti” that would make clear envisioning of the trend or event more difficult. Glenn¹³ further suggested using primary, secondary, and tertiary circles to prevent this problem and organise the associations among the items. These suggestions were followed in our workshop and three different circles were grouped to answer the specific questions associated with each of the megatrends.

Second, the facilitators carefully listened to all participants and, when items were placed on the wheel, any ambiguities were clarified. Moreover, the facilitator had to be aware of the perspectives or biases they brought to the workshop in order to dispassionately capture the possibilities suggested for the megatrends. Glenn also cautioned that a common mistake was to consider the ‘potential’



impacts or consequences as ‘true’ consequences and the actual reality.^{13,14} Therefore, the facilitator had to avoid making unsupported or premature judgements. In our workshops, a systematic procedure for each step was designed and implemented in this meticulous manner: five megatrends affecting the future were set as the starting points for the workshops, all respondents were provided with the same information about the Futures Wheel method, and the facilitators were properly trained in use of the method. Using the selected megatrends as the participants’ starting point was justified as being widely recognised in the literature.²⁵⁻²⁸ The participants were also encouraged to use the wildcard option when there were things that surprised them or when alternatives to the proposed megatrends needed to be expressed.

DISCUSSION

If future trends in healthcare and eHealth are not considered, then important opportunities for the development of appropriate, high quality services might be missed. Although the FW method is a rather simple technique for participants, requiring only paper and pen, a facilitator with motivation, and participants with productive minds transform it into a powerful tool for the exploration of the future. The method is a creative tool that generates and guides input for thinking about the future. As Gabriel stated, “The human brain is trained to anticipate future developments. We have the capability of mental time travel into the future, or the construction of alternate possible situations.”²⁹ Hence, we must use this capability to consider the future of healthcare

and particularly the future of eHealth and its role in current and future development and implementation processes.

A flexible time frame can be helpful. Considering futures research, a fundamental question is “how far ahead is the future?” Passig³⁰ suggested that futures research should focus on five time-frames: the immediate range could be up to five years; a short range of five to ten years; a medium range of ten to thirty years; a long range of thirty to fifty years; and an extremely long range of from fifty to one hundred years.³⁰ However, uncertainty increases as we move away from the present and look further into the future.²³ Although a specific year as a fixed target was selected in the present case, not all studies use precise time ranges. For example, some consider the future as a moving target, where the behaviors and actions of people are synthesized;³¹ thus, there is no requirement to set a specific year in the future as a fixed target when performing futures research.

Based on the authors’ experiences, the Futures Wheel method provides several benefits for healthcare, and specifically eHealth. First, this method is quick, inexpensive and relatively easy to use. Data can be organized on the alternative futures within defined areas such as eLearning and eHealth. The data collected using the FW method can be used for many purposes, such as the reformulation of job descriptions or requirements needed in evidence based evaluation of eHealth interventions in future healthcare.

Many healthcare personnel, especially in Nordic countries, represent generation X, whose birth

years range from the early-to-mid 1960s to the early 1980s. Such individuals are not 'digital natives' when compared to their 'future colleagues' from generations Y and Z who are considered globally connected and technological oriented. Therefore, structured methods like the Futures Wheel bring together older and younger professionals to grasp and describe eHealth phenomena. By sharing insights, views and perspectives, they can widen each other's empirical knowledge base. Another benefit of using the FW method is understanding how predictions will influence planning and decision making in healthcare systems, facilitating the role of healthcare professionals to participate in evidence based decision making to inform patients, other experts and policy makers.^{2,5,6,29}

Even though there is no set of rules defining how to think about the future in a scientific manner,³¹ using well-planned forecasting techniques such as the FW method can help healthcare professionals make decisions that strengthen evidence-based practices and avoid 'silo thinking'. The Futures Wheel method can also be used to encourage the healthcare workforce to view the future differently. eHealth, with its multi-professional workforce, can leverage such structured forecasting techniques for anticipating the future of eHealth in all of its capacities. Facilitators for the FW method should guide eHealth participants toward considering mobile, ubiquitous, personalised health using terms like availability, accessibility, acceptability and quality in order to see essential elements of eHealth.

CONCLUSION

eHealth, the use of ICTs for health, has been and continues to be disruptive technology, perhaps already reflecting elements of the ITicine. Human factors have been identified as a recurring barrier to eHealth initiatives and uptake, caused in part by lack of awareness and preparedness for new technology options and changes in work process and flow.⁶ Applying the Futures Wheel method may allow anticipation of eHealth induced change in healthcare. History has shown that the dissemination of eHealth is time-consuming and complex. Therefore, it is crucial to implement and evaluate methods that can predict the futures for eHealth.

When using the Futures Wheel method, one should be fully aware that thinking about the future using a systematic procedure means accepting that we cannot know the future. But the world is characterised by structural and dynamic complexities suggesting that illustrative thoughts, plausible

explanations and alternative futures can and should be considered.^{21,24,31} The practice environment of future healthcare, incorporating eHealth, will be different from what exists today. Therefore, the method presented here could be very useful in viewing the future of eHealth from a rich variety of alternative perspectives. Overall, the FW method might encourage and support a prospective attitude of individuals toward future events, such as the identification and acquisition of the skills and knowledge needed in the development of eHealth technology and the use of its applications. The authors strongly recommend that the FW method guidelines be thoroughly followed to further confirm the validity of the method. All of the points made in this paper should be taken as the basis for further discussion, and all rules for the FW method should be under continuous critical reflection.

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COMBATING MALNUTRITION AMONG PREGNANT WOMEN, MOTHERS AND BABIES IN THE RURAL AMAZONIAN FOREST: WHAT CAN TELEHEALTH DO?

ABSTRACT

Purpose: Malnutrition is a current public health problem and a leading cause of childhood morbidity and mortality among the indigenous population in the Amazon forest. This may be related to the nutritional transition observed among indigenous women in Brazil. This research aims to empower health professionals to promote food and nutritional education for mothers and babies living in the forest of the Brazilian state of Amazonas and its Colombian border. We describe our experience using telehealth to combat malnutrition among pregnant women, mothers and babies in the rural Amazonian forest. **Methods:** This is a qualitative study that included three interventions: field visits, a scoping review, and online meetings. Data collect from field visits and the scoping review were used to identify demands and incorporate themes discussed in the virtual meetings held at telehealth units. Sessions used the web conferencing platform of the state of Amazonas and were facilitated by Brazilian specialists. Locations were selected according to existence of telehealth site. **Results and Conclusions:** Seven telehealth sessions were held between April and December in 2018 and three in 2019, including 14 different locations equipped with telehealth points, and lasted 120 minutes each. The main findings were that telehealth services can be an instrument to establish a knowledge exchange between health professionals and indigenous people. The participation of indigenous people in social media could be an instrument to maintain their culture and to promote their healthcare, especially traditional and healthy dietary patterns.

Keywords: telemedicine; indigenous peoples; women's health; child health; food and nutrition security; Brazil

INTRODUCTION

Amazonas, named after the river, is the largest state in Brazil with a territorial area of 1,559,168 km² and an estimated 4,144,597 inhabitants in 2019. The demographic concentration is in the range of 2.2 inhabitants/km²; 79.1% living in urban areas and 20.9% in areas considered rural, including the riverside.¹ This is one of the last tropical rainforests crossed by the Amazon River. Isolated native indigenous populations are still found in the Amazonian forest. The river is the state main road and because of that, life there is regulated by the periods of floods and droughts. Long distances and natural barriers hamper continued care provided by multidisciplinary health professional teams.

Data from the First National Survey of Indigenous People's Health and Nutrition in Brazil registered a nutritional transition among Brazilian indigenous women. The women's and children's health indicators measured during the survey were worse than those documented for the national Brazilian population. Moreover, the prevalence rates of anemia in indigenous children were almost double those reported for non-indigenous Brazilian children.^{2,3} There has been an impoverishment of indigenous diets related to an influx of industrialized foods that is affecting mothers and babies and producing anemia and malnutrition.⁴

Among the related problems were changes in their dietary habits, replacing traditional food and exclusive breastfeeding with ultra-processed and industrialized foods having low nutritional value that were made available to the villages.⁵ It is important to revert this and regain better nourishment for indigenous children aged 0-5 years. The family nucleus is paramount in this process and the mothers need to be better educated in relation to satisfying nutritional needs.

This research was designed to find ways to support actions that might contribute to achieving better nutrition among indigenous women and children. The main hypothesis was that empowering primary healthcare professionals (PHCP) to promote food and nutritional education among mothers and babies from the Brazilian Amazon Forest will aid in reducing anemia and malnutrition among this population. The study used Telehealth Amazonas, the state branch of the Brazilian National Telehealth Network Program, which is present in 62 municipalities of Amazonas and regularly used by PHCP for teleconsulting, online education and telediagnostic activities.⁶ The study territory included demarcated lands near the Brazilian-Colombian border in the districts of Alto Rio Negro and Alto Rio Solimões, where 52 different indigenous ethnic groups live.⁷

This paper describes the methods and research approaches used to construct the virtual meetings and our experience in using telehealth to combat malnutrition among pregnant women, mothers and babies in the rural Amazonian forest.

METHODS

This is qualitative study that uses a theoretical framework based on the Grounded Theory (GT), developed by Corbin and Strauss,⁸ which is broadly used in public health studies involving the fields of anthropology and medicine. In GT the researcher tries to grasp reality in circular movements, where he recreates and interprets the dimension of his research object with a constant comparative analysis of data collected.⁹ Therefore, during the study, the categories were progressively identified, and their meanings were analyzed and integrated to provide guidelines and help to understand the phenomenon under investigation.

The study took place in three Amazonian urban centers: two in Brazil – São Gabriel da Cachoeira and Tabatinga, and one in Colombia – Letícia and included three interventions: field visits, a scoping review and online meetings. The first two interventions are not in the scope of this paper, that presents the results of the online meetings.

The field visits focused on PHCP and were carried out by two researchers, for seven days. By using a participatory approach, PHCP experiences were accessed alternating individual deep non-structured interviews and interviews with the group, performed at different health facilities. Additionally, river ports and fairs that sell crafts and agriculture products were also visited by the researchers in the two cities in Brazil and the visits were guided by local health professionals. All the information collected, including testimonials, places visited and researcher's observations were documented in personal field diaries. These data are part of another publication, under review.

The scoping review (SR) was developed to confirm the themes for the virtual meetings, to investigate the living and dietary habits of mothers and babies from the Amazon forest and to observe the existence and viability of previous experience with virtual access in the region. It was based on publications that obligatorily included indigenous living in villages or reserves in the Amazon forest, published in Portuguese, English or Spanish and with open access. The following databases were searched: Pubmed/ Medline, Embase (both on the biomedical context), Web of Science, Scopus and Scielo (multidisciplinary databases), Social Service Abstracts and Lilacs (Anthropology and Social Sciences focusing on Latin America and Caribbean researcher). There was no date restriction, and the principal search queries were (Indigenous population OR Amazonian Indians OR Amazonian tribes) AND socioeconomic aspects AND (amazon OR Amazonian OR Amazonas OR Amazonia OR Amazonian rain forest OR Amazonian rain forest OR Amazonas rain forest OR Amazonia rainforest OR Amazonian rainforest OR Amazonas rainforest) with minimal syntax adaptations. The review was performed in January 2019 and has been reported.¹⁰

The themes and content for the telehealth sessions were determined based on the observations from the field visits and insight gained from the scoping review. Sessions used the web conferencing platform of the Amazonas and were facilitated by Brazilian specialists and PHCP. The locations were selected based on the previous existence of telehealth in the site. The meetings were designed to address PHCP and to last up to 120 minutes each. The schedule of the sessions and the PHCP participation were based on the discussion and approval during the site visits.

The research was approved by the Research Ethics Committee of Instituto Fernandes Figueira –IFF/ FIOCRUZ—RJ/ MS under registration CAAE 85439418.8.0000.5269.

RESULTS

The field visits and the scoping review confirmed that indigenous people have access to the Internet and smartphones, as have being published before¹¹ and that the health teams have used the state telehealth network a few times to access the indigenous population. It also confirmed that the prenatal care was precarious, as also described before¹² and exclusive breastfeeding was reduced and strongly influenced by the subsistence of women and their family.¹³

The scoping review included 21 multidisciplinary studies that addressed topics related to the lifestyle of women and children in the Amazon, their diet during pregnancy and the postpartum period, breastfeeding practices, the introduction of solid foods to the baby, and the care of health services.¹⁰

The results confirmed that traditional food has higher nutritional value than industrialized food and suggested that local cuisine was a source of income for indigenous women in the urban environment as well as a link between ethnicities. The need to incorporate the health promotion paradigm and cover themes such as indigenous acculturation in the Amazonian urban centers, the arrival of the Internet in the villages and the role of distance care, require further investigation to better address the problem.

The new knowledges gained during the field visits and scoping review were used to guide the online meetings. Seven telehealth sessions were

held between April and December in 2018. These sessions included 14 different locations equipped with telehealth points, and lasted 120 minutes each. The topics discussed included presentation of the research project; nutrition of pregnant woman; women's nutrition in the puerperium; breastfeeding / nutritional and health related information for a baby's first six months of life; alcoholism in pregnancy; and agroecology and sustainable food systems. Digital graphics for Internet use were especially developed to disseminate all topics. (Figures 1) After obtaining the consent of all involved, the sessions were recorded, edited and became learning tools for health professionals in the Open University of the Unified Health System (UNA-SUS) - a public repository from the federal government.¹⁴

Three virtual meetings happened in 2019, addressing out-of-hospital births; the list of foods offered for babies and mothers at indigenous health facilities; and indigenous peoples' presence on the Internet. (Figure 2)

Three virtual meetings happened in 2019, addressing out-of-hospital births; the list of foods offered for babies and mothers at indigenous health facilities; and indigenous peoples' presence on the Internet. (Figure 2)

Internet connection in the Amazon forest is not always reliable. Despite this, telehealth units of 11 out of the 14 municipalities were able to consistently participate in the conferences with specialists, interacting through video and audio. (Table 1)



FIGURE 1. Themes in 2018



FIGURE 2. Themes in 2019

Date	Subject	Primary Care Telehealth Points	Issues Raised/Possible Solutions
April	Presentation of the research project	7 sites: Manaus, Tabatinga, Tefê, Barcelos, Itamarati, Rio de Janeiro, and São Paulo de Olivença	<p>Main issues raised:</p> <ol style="list-style-type: none"> 1. The cultural influence in healthcare. 2. Different languages are a barrier between indigenous population and PHCP. 3. In Alto Rio Negro territory, schools and health facilities frequently consume products from subsistence family agriculture. They work in international projects with Peru and Colombia. 4. People of the Maku tribe like to eat a typical food named Turú (<i>Teredo navalis</i>); but its nutritional value is unknown by PHCP 5. What is the best food for pregnant women who are underweight? 6. How to reverse the problem of pregnant women and children under six months who are undernourished due to ultra-processed food consumption 7. Several pregnant women were older than 50 years old in indigenous health facilities in the Alto Rio Negro area. 8. What can PHCP do better to assist pregnant women with hypertension in a distant village? 9. Although the rural areas have received the "Ministry of Health official booklets for pregnant women", the number of available forms weren't enough to attend the local demand. 10. How can the district access for the federal document of pregnant be improved? 11. Indigenous people like to watch videos and messages. They have smartphones primarily to listen to music and to take photos because there isn't Internet connection in the villages. <p>Possible solutions:</p> <ol style="list-style-type: none"> 1. PHCP often work with shamans to assist indigenous children. 2. The "Ten steps for healthy food", a government project, is present in the villages. 3. One Colombian project has documented traditional indigenous recipes 4. Tabatinga's maternity is adapted to indigenous mothers. 5. In Alto Rio Solimões territory, there is a project to avoid and prevent alcoholism. 6. In Alto Rio Negro area, PHCP teams have been trying to strengthen the bond with midwives.
May	Nutrition of the pregnant woman	4 sites: Manaus, Manicoré, Tabatinga, Rio de Janeiro	
June	Women's nutrition in the puerperium	6 sites: Manaus, Tefê, Coari, Urucará, Itamarati, Rio de Janeiro	
July	Feeding during the first six months of life and breastfeeding	6 sites: Borba, Alvarães, Eirunepê, Boa Vista do Ramos, Tabatinga and Coari	
August	Feeding and introduction of solid foods to babies	2 sites: Manaus, Rio de Janeiro	
November	Alcoholism in pregnancy (Foetal Alcohol Syndrome)	2 sites: Manaus, Rio de Janeiro	
December	Agroecology and sustainable food systems	2 sites: Manaus, Rio de Janeiro	

TABLE 1. Summary the themes and issues raised during the 2018 telehealth conferences.

DISCUSSION

The indigenous population is growing in the Amazon forest area^{2,3} but it has been noticed that their traditional culture is being missed among the different ethnical groups. This is causing a nutritional transition that has been an object of study of several disciplines and sectors. This was also noted in the current study and the changes in dietary habits may be related to the malnutrition and anemia diagnosed among indigenous population. To be able to change this, it is also important to emphasize that indigenous people have the right to maintain their culture and the ability to freely communicate their needs, and both of these rights are protected by the United Nations Declaration on the Rights of Indigenous Peoples.¹⁵

The themes selected, and the discussions held during the virtual meetings raised several concerns, as listed in table 1, but also highlighted local solutions that may help PHCP to respond. Language and cultural barriers may be reduced by the collaborative work of health professionals and traditional indigenous leaders, such as the shamans. It will also be important to shift the use of smartphones from a tool to access music and pictures, to include more health-related subjects and positive messages. For the time being, the results of the study are encouraging, and suggest that virtual meetings for sensitizing PHCP are viable and may help to review the approach to promoting food and nutritional education among indigenous mothers and their babies. The results also confirmed the viability of using telehealth as a mean to empower health professional. Once

empowered, health professionals will be able to consider the inclusion of face-to-face activities, in areas without telehealth, to educate indigenous women and mothers and reinforce cultural traditions. The materials that were produced during the virtual meetings will be useful for sensitization activities, recognized as successful in the literature, such as workshops using audio-visual recording of traditional cuisine, building on female protagonist groups^{16,17} and building on previous experience with online meetings carried out with similar objectives.¹⁸

Virtual meetings and face-to-face activities may also be seen as an opportunity to give voice to indigenous people and promote an environment of exchange and dialogue about their eating habits with the team of family healthcare professionals. They may also represent an opportunity to discuss and produce audio-visual files related to ancient feeding practices of indigenous people that may be temporarily forgotten. They can also open a channel for specific group discussions about the protein, caloric and nutritional value of the traditional recipes compared to the new nutritional transition, and the health-related consequences in children and women. The use of Internet and social networks may help enhancing the network among indigenous women¹⁹ and the effort to also involve PHCP may reinforce a pedagogical interchange²⁰ between the traditional values in the context of being an indigenous women and the biomedical knowledge.²¹

CONCLUSION

The results suggest that telehealth services are viable in Amazonian urban centers and they could be an important tool to establish a knowledge exchange between health professionals and indigenous people. Promoting the use of social media among indigenous people could also be an instrument to maintain their culture and to promote healthcare, more specifically in relation to traditional and healthy dietary habits. More studies will be necessary to monitor and evaluate the long-term effects of these creative approaches to empower the nutritional and alimentary security of indigenous population. And to evaluate the impact of this strategy on improving the health indicators of mothers and babies of the Amazon territory.

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