MEPI NITRUE

Celebrating our REMETH PhD Students

SOUTH AFRICANS AND AMERICANS IN PARTNERSHIP TO FIGHT HIV/AIDS
PEPFAR

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

In clinical research, you want to know what is most important, and what is most important may be locally important and not necessarily globally important. If we are going to reduce the negative effects of illness or diseases that cause death, it's important to have individuals with the capacity to think scientifcally around clinical problems. That's the importance of PhD training.

Professor Quarraisha Abdool Karim

Associate Director: CAPRISA, Member: MEPI Advisory Committee

Foreword

DR SANDY PILLAY

Communicating Principal Investigator, MEPI UKZN

UKZN's Medical Education Partnership Initiative (MEPI) programme was designed to promote PEPFAR's aims of increasing the number of medical graduates, strengthening incountry education systems, building clinical research and addressing our unique challenges at UKZN. The REMETH PhD support programme aims to improve retention of academics, produce faculty of high quality and calibre, provide academic opportunity for future role models and produce locally relevant, good quality research that will strengthen public health systems.

This programme, which will have produced about 50 PhD graduates when complete, was structured with the understanding that these academics are often responsible for teaching as well as clinical duties and require special support and encouragement to complete a PhD. MEPI provided biostatistics reasoning support and courses (face to face and online), mentorship, financial assistance, research administrative support and data capturing assistance. In addition, students have attended grant, scientific and manuscript writing workshops to enable them to attain additional grant funding for their research and to structure their thesis and research papers. All research students enrolled in the MEPI REMETH programme undergo Good Clinical Practice and Human Subjects Protection training to ensure full compliance with international and local standards.

As South Africa moves towards a new model of health care, based on a preventative approach, we need to re-engineer our teachings in line with this paradigm shift. The MEPI REMETH programme aims to support this by empowering health professionals with skills to sharpen their knowledge and enhance their exposure to the health challenges within a South African context.

This publication plays tribute to our PhD students as they embrace their successes and the critical role their research has empowered them to play in finding solutions and possible cures to our health challenges. On behalf of MEPI, I wish them well and look forward to their future accomplishments. Thank you to all those who have made this initiative possible.

The Medical Education Partnership Initiative (MEPI) project at UKZN in KwaZulu-Natal is a grant awarded by the United States based bodies, the National Institutes of Health (NIH) and the President's Emergency Plan for AIDS Relief (PEPFAR), to 13 partnering African universities and is aimed at improving health care education, research and training capacity at medical institutions in Sub-Saharan Africa.

The key drivers of the programme is to address the shortage of competent doctors, nurses, pharmacists and other health professionals to manage HIV/AIDS in KwaZulu-Natal.

The strategy is also aimed at improving the quality of medical education and research at undergraduate level to ensure medical graduates emerge from our institution with scientifically sound research skills needed, especially in a country with a quadruple burden of disease. Of significance is that the MEPI programme improves capacity and skills in preparation towards the new National Health Insurance (NHI) plan being rolled out in phases over the next 14 years which would shift the health focus from a predominantly curative model to a disease prevention model using the Primary Health Care (PHC) approach.

The University of KwaZulu-Natal (UKZN) is the only higher education institution in the province to have been awarded the MEPI grant in 2010 and is among several African institutions to have been a proud recipient.

Research Methodology (REMETH) PhD support Programme

Aimed at the School of Clinical Medicine, PhD students who had a protocol or concept paper could be considered for early support for the PhD. Support included:

- Seed funding
- Protocol development and refinement
- Writing workshops
- Biostatistics courses
- Administrative support was provided – admin officer, data capturing, regular meetings and assistance from Columbia University.

A key factor in encouraging students to enter the PhD programme, says Associate Director of CAPRISA, Professor Qurraisha Abdool-Karim, is the desperate need for South African solutions to local problems.

"If we don't have clinical researchers we will be behind in responding to emerging challenges and one of the biggest issues is HIV and AIDS. Professor Umesh Lalloo had a lot of insight and vision in this, which is why he included the training of PhD clinicians in his MEPI application," says Professor Abdool-Karim.

REMETH candidates were also selected with the aim of encouraging transformation with respect to race, gender and formed part of efforts to ensure this was aligned with the transformation of the university and the health system in South Africa.

As part of their contractual obligations, REMETH candidates need to remain in the public sector in the SADC countries for a period of two years following the completion of their degree. This also serves to foster the retention of academics within the African region. REMETH graduates are expected to play key roles in both academia and public health, while their research studies are also likely to contribute towards formulating robust, scientific led responses to local health challenges which would ultimately improve patient care.

DR SANDY PILLAY *Communicating PI*

As former director of the Global Fund's HIV corporate program, Dr Pillay also developed and facilitated UKZN's post-graduate program in clinical HIV management. He served as Clinical Research Coordinator for the Durban International Clinical Trials Unit where he is also investigator on this grant. Dr Pillay was the South African lead investigator of a collaboration between UKZN and the University of Connecticut which successfully designed and evaluated a risk behaviour reduction strategy for HIV-infected people in KZN.

PROF. SCOTT M. HAMMER, M.D. *(Columbia University), Co-PI*

Dr Hammer serves as Principal Investigator of the National Institute of Allergy and Infectious Diseases and investigator in the AIDS Clinical Trials Group and the HIV Vaccine Trials Network. Amongst other roles, he also served as former vice chair of the World Health Organization Strategic and Technical Advisory Committee for HIV/AIDS. He currently serves on the editorial board of the New England Journal of Medicine.

PROF. DOUGLAS WASSENAAR, *Co-PI*

Professor of UKZN's School of Applied Human Sciences, Professor Wassenaar is also chair of the University's Biomedical Research Ethics Committee and South African Human Sciences Research Council's Research Ethics Committee. He also serves on the World Health Organisation/UNAIDS Vaccines Advisory Committee and is a member of the interim steering committee of the Global Forum for Bioethics in Research. Professor Wassenaar also heads the MEPI grant that trains selected UKZN staff and postgraduate students in research ethics.

PROF. PHILIP LARUSSA *(Columbia University), Co-PI*

Professor Philip LaRussa is the Principal Investigator for the NIH-funded Women's & Infants' Transmission study and the International Maternal Paediatric Adolescent AIDS Clinical Trial Centre at Columbia University. His research interests include the development of resistance to antiretroviral therapy in HIV-infected women and children and adherence to antiretroviral therapy in infected children. He also leads a team providing clinical care to HIV-infected children in Vietnam, Ethiopia, South Africa and China.

PROF. JAGIDESA MOODLEY, *Co-PI*

Involved in the Women's Health and HIV Research Group at UKZN's Department of Obstetrics and Gynaecology, Professor Moodley's interests include high-risk obstetrics and management of hypertensive disorders of pregnancy. He has also chaired The National Committee on Confidential Enquiries into Maternal Deaths in South Africa and The Essential Steps in the Management of Obstetric Emergencies Advisory Board, and is a former government advisor on maternal health.

PROF. RAZIYA BOBAT, *Co-PI*

Professor Bobat is credited with starting the first paediatric HIV clinic at King Edward VIII hospital in Durban in 1990 and completed a Doctoral thesis in the natural history of vertically transmitted HIV infection – the only study of its kind in Africa. Professor Bobat has been the recipient of several large research grants for paediatric HIV infection and is a founding member of South African Society for Paediatric Infectious Diseases and currently serves as President of South African Paediatric Association.

"I believe as a woman there will be choices that you have to make. You have to make those choices consciously and have no regrets."

KOLEKA MLISANA
Associate Professor and Head of Medical Microbiology at UKZN and the National Health Laboratory Services (NHLS)

Dissertation: The impact of sexually transmitted infections (STI) and genital tract inflammation on HIV-1 acquisition and rate of disease progression in subtype C infected women.

The start of my journey...

My path was paved at a young age on the outskirts of the Eastern Cape where I grew up with my three siblings and my parents. Unfortunately, we lost my father in the 60's and were raised by my mother who shaped my character and moulded me into the confident woman that I was to become with a deep rooted faith in God. It was a given fact then, that if you were good at school, you would pursue medicine and so, my path had been chosen.

When my father passed away in the 60's, it was an era where it was unheard of for a young African woman to drive a car which is what my mother learnt to do back then. She continued to run the small spaza shop we owned and seeing her drive really planted that seed in me that a woman was capable of pursuing all her dreams and ambitions.

About My PhD

Doing a PhD stimulates a rethink about the impact of your work and forces one to bring meaning to your research and share your findings with the world. It is also an opportunity to turn science into a practical reality where people can relate and understand the impact of research on their lives.

Key findings

A key finding in my study was that vaginal discharge is a poor predictor of STIs and that syndromes management of STIs misses a significant proportion of women with asymptomatic infections. The level of genital inflammation, as measured by cytokine concentrations in cervico-vaginal lavage, was similar in women with symptomatic and asymptomatic infections and placed both groups at increased risk for HIV infection. While laboratory-diagnosed STIs and the presence of inflammatory cytokines in the genital tract were associated with increased susceptibility to HIV acquisition, vaginal discharge was not.

The study also showed that recognition of signs and symptoms of acute HIV infection was important for early diagnosis of HIV infection. Another important finding was the high rate of rapid HIV disease progression, with nearly half of these subtype C–infected women progressing to a CD4+ T cell count of below 350 cells/µL within two years of infection. The implications of these findings with the increase of CD4+ T counts to 500 for ART initiation will see the majority of patients requiring ART initiation within their first year of HIV infection.

Where to next?

We are now in an era where we could say we are on the brink of conquering HIV. However, the next biggest challenge we face is the impact and effects of this epidemic. Whilst we might have a good handle on the HIV and AIDS epidemic, the co-infections remain a battle.

Another major area is the devastation HIV has caused at a social level. We are faced with orphans, and many teenagers who contracted HIV from their mothers.

There is a lot of work still to do on the post epidemic effects and, of course, the cure for HIV, which I am confident is drawing closer!

"If I can stimulate a young mind to be a critical thinker and keep on asking questions, I will have achieved my goal as a teacher."

DR MERGAN NAIDOO
Head: Clinical Unit, Department of Family Medicine UKZN
Dissertation: Improving obstetric surgical safety in KwaZulu-Natal

The start of my journey...

My involvement in maternal health began in Greytown where I developed a keen interest in this area of health after running the maternity unit for three years. After leaving Greytown and starting a career as a Family Physician at Northdale Hospital, I was asked to help commission the district level obstetric service. I launched this successfully whilst also moving on to work as a lecturer/family physician at Wentworth Hospital in 2008.

In 2011, I was asked to be the family medicine maternal death assessor for KZN which expanded my understanding and strengthened my theatre experience of some of the challenges encountered by clinicians in the management of pregnant women within the public sector.

Why maternal health?

South Africa, being an upper middle-income country has a maternal mortality ratio that is unacceptably high especially since many of these deaths are preventable. Prof Jack Moodley who is the chairman of the National Committee for Confidential Enquiries into Maternal Deaths in South Africa (NCCEMD) suggested that we test the effect of the WHO surgical safety checklist, which had not been tested in maternal surgery anywhere in the world, on surgical outcomes in KZN.

A woman who delivers her baby using the surgical route (Caesarean Delivery) has a 2.8 times greater risk of death compared to a woman who delivers her baby normally. This led to the development of the concept which involved measuring the impact of a modified WHO surgical safety checklist on maternal outcomes in KZN. This safety checklist was implemented in 10 hospitals in KZN and the surgical outcomes and the safety culture in theatre was measured over a nine month period. The outcomes were compared with hospitals that did not implement the safety checklist.

The results...

In retrospect, the educational intervention was far from ideal and the intervention relied on the internal motivation of healthcare workers to implement at the checklist. Encouragingly, however "checklist champions" emerged in four hospitals leading to good implementation and the benefits of this resulted in a positive impact on surgical outcomes and safety culture. A significant improvement in postoperative deaths and postoperative bleeding occurred in hospitals implementing the checklist well.

Lessons learnt...

Teaching intervention, monitoring, evaluation and the importance of champions has been developed into the training module. The results of my research were presented to the National Department of Health and to specialist subgroups in the NCCEMD, resulting in support for the implementation of the surgical safety checklist as a minimum standard of operative care in South Africa.

In addition, Discovery Health provided funding for the development of a training module which could be used for all hospitals in KZN. The module is currently being field tested with a plan for a province-wide implementation in 2016. The module is also going to be integrated into the Essential Steps for Managing Obstetric Emergencies (ESMOE) which is an emergency training course targeting healthcare workers working in the obstetric environment run by the provincial and national DoH. I am currently a master trainer for the ESMOE programme in KZN.

I do not recall working this hard for this long for any of my previous degrees so, having completed the PhD, it's great to sit back and savour the moment. It feels awesome!

"Through this PhD I learnt that there are things that we take for granted. It taught me analytic skills and the need to find the root cause holistically before adopting a remedial plan of action which is factually based."

DR EMELDA ZANDILE GUMEDE

PhD: An analysis of the health behaviour of children from child-headed households in a selected health district in KwaZulu-Natal

The start of my journey...

I grew up in Zululand as the youngest in a family of ten siblings. After completing my matric in Umlazi, I began training as a general nurse before taking up other studies including a masters degree.

Working with children...

Whilst working at the Department of Social Welfare, I was tasked with taking care of the health needs of vulnerable children who were in conflict with the law. These children were charged with serious crimes including rape, theft and murder. It really was an eye opener for me as we faced huge constraints in the logistics for caring for these children, particularly as whilst health services were free for these children, there were a number of barriers to such access which was very frustrating.

My PhD

Having being exposed to the challenges faced by vulnerable children, I knew that my PhD needed to focus on this issue and so I registered for my PhD in 2009. Despite the workload, I am very pleased with my achievement and thank the support of my supervisor who assisted in keeping me focussed.

Lessons learnt

The changes in socio-economic status, weakened family links and the HIV/AIDS pandemic are all factors which are largely responsible for the high numbers of orphaned children in South Africa today.

My PhD is an attempt to bring the very difficult circumstances of these children into a documented reality so that appropriate intervention can be strengthened. It was very disheartening to see young children assume the role of head of family with little or no mentoring, as these children were left to fend for themselves, having lost parents, mainly to HIV. In many cases, I found that these children had become infected whilst caring for their infected parents, as a result of the lack of family support.

Recommendations

Whilst government has tried to acknowledge the difficulties of child-headed households through legislation and social benefits, there remains a number of challenges in access to health services, particularly as the law requires that children under 16 can only access such services with an adult. This makes it very difficult for children from such households who fear the embarrassment of questions and, therefore, prefer not to access treatment in many cases.

There, therefore, needs to be clarity from government on the age of access for children from child-headed households which needs to be clearly communicated to all stakeholders involved in their care.

A suggestion to address the dilemma for children living on their own is the possibility of children from child headed homes to carry a specific card which contains their details and circumstances. Many children have reported that the probing questions at health facilities about their status and their deceased parents often evokes emotional stress. A card with therefore be an appropriate intervention to address such matters.

"The funding received from the MEPI-REMETH Programme was used to directly support my laboratory-based research and has expanded my skills set and exposed me to the fascinating field of antiretroviral drug resistance."

DR CHERYL BAXTER
Research Associate, CAPRISA

Study: Impact of intermittent tenofovir 1% gel on hepatitis B virus (HBV) infection

Background to my study

Young women between the ages of 15 and 24 years in sub-Saharan Africa are particularly vulnerable to HIV and account for 76% of the total cases in that age group.

Despite the greater vulnerability of women, current HIV-prevention strategies provide little protection for them, especially young women. Due to gender power imbalances, women are often unable to successfully negotiate condom use with their male partners, insist on mutual monogamy, or convince their partners to have an HIV test.

Biomedical technologies, such as microbicides, that women can use to protect themselves from acquiring HIV are urgently required. However, it is important to ensure that the development of new products for HIV prevention do not adversely impact on other diseases.

Given that the use of tenofovir could exacerbate hepatitis infections, my study aimed to establish if women with hepatitis B virus infection could safely use tenofovir gel for HIV prevention and is the first study to provide data on the safety of using tenofovir gel for HIV prevention in women infected with hepatitis B.

The study was conducted at two of CAPRISA's (The Centre for the AIDS Programme of Research in South Africa) clinics in KwaZulu-Natal; one in the Durban city centre and the other in the rural Vulindlela sub-district under the supervision of Professor Salim Abdool Karim.

Findings

Conducted among 889 women using intermittent tenofovir 1% gel for HIV prevention, the study found no association with hepatic flares, no effect on hepatitis B viral load and did not enhance the development of tenofovir resistance genetic mutations. Women with HBV infection can therefore safely use tenofovir 1% gel for HIV prevention without adverse impact on their HBV infection.

MEPI Assistance

Research on Hepatitis B virus resistance testing and sequencing of the HBV genome was made possible through the support from the MEPI Programme. The funding received to directly support my laboratory-based research has expanded my skills set and exposed me to the fascinating field of antiretroviral drug resistance. In addition to enhancing my laboratory skills, the biostatistics courses that I attended during my MEPI scholarship were invaluable in helping me understand and interpret my data.

Women with HBV infection can therefore safely use tenofovir 1% gel for HIV prevention without adverse impact on their HBV infection.

"The PhD has confirmed my view that a lot more public awareness is needed to ensure women are aware of the dangers of skin-lightening products and the harmful ingredients they may contain."

PROFESSOR NCOZA C DLOVA
Head of Dermatology Department, UKZN

PhD: Ethnic skin and hair disorders in KwaZulu-Natal: A study of the spectrum of ethnic skin and hair disorder, and the composition and use of skin-lightening preparations, traditional cosmetics and sunscreen

Areas of research

- The use of skin lightening products
- The use of clays as a sunscreen among mainly rural women
- Application of indigenous plants for skin care purposes
- Knowledge and perceptions of skin cancer and use of sunscreens
- Hair loss among African and Indian women in KwaZulu-Natal.

Findings

1 Skin-lightening products are used by a third of African and Indian women despite a poor understanding of the risks associated with the use of these products. A total of 131 (32.3%) respondents had used skin-lightening products, with usage exceeding 50% for those with little formal education and 14% in those with tertiary education. More than a third of women believed that a lighter skin tone increased self-esteem, implied that a woman belongs to a higher socio-economic class, helped women get better job opportunities, and increased a woman's chances of getting married as it is considered more beautiful by men.

A significant number reported that their skin had been damaged by the skin-lightening product that is, 23% of Africans and 11% of Indians. Yet, surprisingly, 90% of women who reported skin damage still expressed themselves as very satisfied with the result.

2 Two clays are typically used by rural women: one white in appearance and the other red. The study found that although the SPF of both clays is low, they provided some degree of UBV as well as UVA protection and are cost effective and easily accessible.

3 The Stembark of Garcinia was collected in Zululand, air-dried at room temperature and milled, while fruits collected at UKZN were first peeled and the nut-like kernels separated from the surrounding fruit flesh. Bark extracts showed potential for development as natural depigmentation agents for skin disorders of pigmentation.

4 Less than 20% of Whites had ever checked their skin for suspicious moles whilst most blacks were not aware they could get skin cancer. The results further showed that only half of Whites reported wearing sun-screen daily or most days and this number was lower among Blacks and Indians.

5 Frontal Fibrosing Alopecia was seen in 90% of females who often used chemical relaxers and traction inducing hairstyles. Such use is therefore discouraged in extensive cases of Frontal Fibrosing Alopecia and the use of wigs rather than weaving is encouraged.

Way forward

Through her research, Prof Dlova has called on more public awareness campaigns and further research into the use of clays as sunscreens on a commercial level. She has also advocated further training of hair stylists in formal and informal settings on hair disorders to ensure appropriate treatment is advised. In addition, Prof Dlova has called on government to step up its regulatory mechanism to ensure more effective control around the production, import and sale of products containing harmful ingredients.

As the first African dermatologist at UKZN, Prof Dlova together with Dr Whittaker, have established the country's first Women Dermatologic Society aimed at addressing all dermatology issues affecting women as well as establishing mentorship programmes for young dermatologists.

My research has exposed the fact that we still have a long way to go to dispel perceptions that equate fairness with beauty.

"Research opens up your mind and encourages you to think in a different way"

DR VINESHREE GOVENDER
Obstetrician, Gynaecologist
PhD: The role of Adiponectin, Leptin, TNF-a and Resistin in HIV-associated pre-eclampsia.

How has pursuing a PhD assisted your professional growth?

Many health professionals today don't have the time to look at a patient holistically. What the PhD did was encourage me to change the way I viewed a patient. I now realise the importance of looking at the different aspects that impact a patient's life, be it socially, emotionally, financially, etc. In HIV for example, we have seen that those women with HIV and pre-eclampsia experience physical changes and it is really important for us to understand how all other factors impact on their body. I feel we would be doing a much better service for our patients if we approached their health in a more holistic manner.

Following your research, what advice would you give to our health ministry as a call to action for women with HIV?

We are heading in the right direction by ensuring all those with HIV receive ARV, and that HIV pregnant women are given immediate treatment regardless of their CD4 Count. But this should be extended to non pregnant women as well.

My research also points to a huge gap in our 18–25-year-old group of women, particularly those who are HIV positive. They are at a higher risk of developing pre-eclampsia and the sooner they are given ARV, the less the risk of developing pre-eclampsia.

What are some of the lessons you have learnt post PhD?

We need to be aware of the tiny changes in pregnancy so that there can be appropriate and timely intervention. The earlier risks are picked up, the better the chance of survival and safe delivery for both mother and baby. Another key finding was that an increase in calcium intake reduces the risk of pre-eclampsia. We really need to be raising more awareness on the importance of calcium during pregnancy and the role of nutrition, especially amongst women who don't access to this information and where their nutritional intake is poor. It's also quite important to reiterate the message that women should still insist on condom use while pregnant as it protects against sexual infections.

Your message to women?

Women need to go for regular check ups, we simply do not encourage this often enough. Regular checks allow for early intervention if there are any problems. Nobody has been able to identify the cause of pre-eclampsia but we do know that controlling your blood pressure ensures a safer delivery. We definitely need to encourage more research on pre-eclampsia as, although we have improved in many areas of our understanding of the risk factors in maternal health, pre-eclampsia remains a life threatening condition.

Young women often mistakenly believe that just because they are young they will have a relatively risk free pregnancy. We must continue to reiterate that pregnancy is high risk and women need to ensure they book early at their clinics.

Any advice to others entering your profession? *It is a very interesting field. If you are really interested in it, pursue your dream, don't hold back!*

Performing this study has improved my insight and understanding of patient pathology and has humbled me as a humanitarian.

The PhD has been extremely useful in helping me gain confdence as a clinician-researcher.

It taught me good analytic skills and the need to fnd the root cause holistically before adopting a remedial plan of action which is factually based.

"My faith in God keeps me going. I believe he has a plan for our lives. As Martin Luther King Jr. once said... faith is taking the first step even when you can't see the whole staircase."

MS BONGIWE GOODNESS NDLOVU
Developmental lecturer: UKZN School of Laboratory Medicine & Medical Sciences
PhD: The field of HIV-1 subtype C vaccine development.

Overview

Ms Ndlovu is currently enrolled for a PhD degree in Medical Virology at the HIV Pathogenesis Programme working under the supervision of Professor Thumbi Ndung'u. She is working on characterizing the evolution of antibody responses as well as the correlation of both neutralizing and binding antibody responses to viral control in acute/early HIV subtype-C infection.

In her study, Ms. Ndlovu analyzed retrospectively a group of 34 HIV-1 infected people from Durban and found that p24 and gp41-specific IgG were associated with HIV-1 slower disease progression. Researchers also identified 4 out of 20 individuals that developed broadly neutralizing antibodies.

These individuals were then analyzed retrospectively and it was found that their antibodies developed at approximately one year following HIV-infection. "We mapped the epitopes targeted by these antibodies and found that they target glycans at position 276 and 332 of the V2 and V3 loop on the viral envelope respectively," says Ms. Ndlovu.

Findings

Her study revealed that some individuals develop strong and potent broadly neutralizing antibodies that could be used in passive immunisation of HIV-1 negative individuals. The study highlights important aspects in the development of neutralising antibodies which could contribute in the design of an antibody-based vaccine.

"These antibodies bind to diverse virus strains and block HIV-1 infection, thus they can be used to provide sterilising immunity."

Impact on future development

Ms. Ndlovu's work is important in defining early antibody responses and their role in HIV pathogenesis. Ultimately, this is important information for the design of the next generation of highly effective vaccines. Further studies are underway to discover why these individuals developed broadly neutralizing antibodies and whether the virus can develop ways of evading these antibodies.

Ms Ndlovu recently won a second prize in **Credentialling** staff category at the annual College of Health Science research symposium for her study entitled "*Evolution of neutralizing antibodies in HIV-1 subtype C infection.*"

She also received a **Department of Science and Technology Doctoral Fellowship Award** in the South African Women in Science awards, 2012.

More recently, she presented her research at the 8th International AIDS Society in Canada this year and also received the **Golden Key international award** as one of the top 15% students within the university.

"The MEPI grant has been an enormous support and development program for my PhD, has enabled me to be a better researcher and ultimately to better supervise other researchers in the field of emergency medicine."

DR DARRYL WOOD

Emergency Medicine Specialist, SCM UKZN

PhD: Snakebites in KwaZulu-Natal – A detailed analysis

About the candidate

Darryl Wood has been the acting Head of the Division of Emergency Medicine at UKZN and the Head of Clinical Department Emergency Medicine at Ngwelezane Hospital. As a key driver behind the establishment of emergency medicine in KwaZulu-Natal and South Africa, Dr Wood is active in teaching and training nurses, medical officers and registrars in the field of emergency medicine.

Why snakebites?

The topic of snakebites for his PhD thesis stems from the high number of snakebites seen and treated at the Ngwelezane Emergency Department, which led to an earlier published pilot study on the topic. He decided to embark on a PhD thesis in 2013 under the tutelage of his supervisor, Professor Richard Hift, and was successfully awarded the MEPI grant in 2014.

Using a large observational descriptive analysis of data at Ngwelezane Regional Hospital over a five-year period, various key demographic and clinical features were identified and quantified from the data.

Findings

Findings from this research indicated that Ngwelezane Regional Hospital was at the centre of this epidemic. The results of this study alluded to certain risk predictors that when present correlated to a significant likelihood of patients receiving a more aggressive treatment called Active Treatment Interventions (ATI), a possible surrogate for severity. We also noted that a major clinical dilemma was accurately assessing the degree of swelling from a cytotoxic envenomation, with particular reference to compartment syndrome. A cross-sectional case-control study was conducted using soft tissue ultrasound to answer this question.

Call to Action

The analysed data and conclusions are to be forwarded to the Department of Health for purposes of providing a strategy for managing snakebites and to develop a treatment guideline for patients and doctors, as no such guideline currently exists. It is hoped that this research and further investigation prompts health care policy makers to acknowledge snakebites as a significant disease and to allocate more targeted resources to manage it. Although this is by no means comprehensive, this researcher has gained greater insight into the different research methodologies used and the analysis of various data sets.

Dr Wood has over thirty publications in peer review journals and has supervised six Master degree students. He has also presented research and given talks at symposiums, national and international conferences.

His current focused research areas include Point of Care Ultrasound, Trauma, Aeromedicine and Snakebites.

This doctoral thesis has raised further questions that demand additional investigation, and research on this disease will continue.

UPDATE *Dr Wood has recently resigned to relocate to the United Kingdom. The MEPI team would like to wish him well in the challenges that lie ahead.*

"I personally believe we cannot win the battle against AIDS if we do not also fight TB, as TB is the leading cause of morbidity and mortality in HIV-infected individuals in Africa."

IKANYENG DOLLY SEIPONE

Medical Scientist

PhD: Investigation of viral characteristics and immune microenvironment between the blood and the central nervous system in patients with HIV-associated neurological disorders or concomitant Mycobacterial tuberculosis infection

Profile

Ms Ikanyeng Dolly Seipone is a medical scientist with a BSc, BMedSci (Hon)(cum laude) and MMedSci. from the University of Kwa-Zulu Natal. Her research journey ranges from sexually transmitted diseases, where she worked on Neisseria gonorrhea resistance to quinolones and effects of different Chlamydia trachomatis strains in/on endothelial cells to Tuberculosis research where she was involved on spoligotyping of XDR-TB strains in the Tugela Ferry region.

Formerly from Botswana, her interest in HIV/TB research was prompted by the high rates of HIV in that country, further exacerbated by co-infection with TB.

She worked on her PhD under the supervision of Professor Thumbi Ndung'u, head of the HIV Pathogenesis Programme and member of the MEPI Advisory Committee.

About her research

The specific aims of the PhD are as follows:

- Comparison of viral loads in blood plasma and CSF amongst HIV-1 positive patients with TB meningitis, and other causes of meningitis.
- To determine resistance profiles of those patients who have persistent viremia in any of the compartments regardless of being on treatment.
- To compare CSF and blood plasma HIV-1 subtype C viral env genetic diversity sequence amongst patients with TB meningitis, non-TB meningitis.
- To compare the immune microenvironment (cytokines and chemokines) between peripheral blood and CNS compartments in patients with and without TB meningitis. This will lead us to understand viral factors associated with neurotropism on TB coinfected individuals.

Findings

This study offers significant insight on HIV- 1 evolution and adaptation to the CNS during TB co-infection and might be valuable in the prevention of HIV-neurological disorders and thus managing HIV/TB co-infection.

Data from this study has been presented in both local and international conferences and work is in progress for publication in the Journal of Acquired Immune Deficiency Syndromes.

"A paradigm shift in focus is required in order for South Africa to address the rising burden of chronic diseases and improve health outcomes and life expectancy."

DR OZAYR HAROON MAHOMED
Academic Coordinator: Graduate Programme of Public Health
PhD: Implementation of an Integrated Chronic Disease Management Model at Primary Healthcare level in South Africa

Profile

Dr Mahomed obtained his undergraduate medical degree at the University of KwaZulu-Natal in 1996, followed by a Masters in Business Administration from the Midrand Graduate Institute in 2002. He went on to specialise in Public Health Medicine obtaining his fellowship in 2007 and the Masters in Medicine – Public Health Medicine in 2008. Dr Mahomed has been recognised as a key technical resource in Public Health by both the National and Provincial Department of Health. His PhD has served to change the paradigm in the management of chronic diseases in South Africa and is seen as a key programme for achieving universal health coverage.

About the PhD

A paradigm shift in focus is required in order for South Africa to address the rising burden of chronic diseases and improve health outcomes and life expectancy. The successful management of chronic diseases requires coordination of services for individuals over an extended time period and across disciplines and is dependent on a strong health system and innovative robustly supported service delivery models that promote patient empowerment. Improvements in the quality of chronic illness care require more than evidence about efficacious tests and treatments but will require a change in the entire system of health service delivery.

The delivery of health services needs to evolve from a system that is organised to respond rapidly and efficiently to any acute illness or injury, with a focus on immediate identification of the problem, exclusion of any underlying serious illness and the initiation of professional treatment.

Patients need to be equipped to take responsibility for their own health.

There have been many models of care proposed to address the problems of chronic diseases. Most of these models have originated in developed countries that have well-performing health systems. Different components of the models have been implemented in different situations, however, there are few models of care that address the integration of HIV/AIDS patients and NCDs.

The HIV program has developed many innovative approaches to the comprehensive management of patients that include task shifting and sharing, adherence counselling and support, defaulter tracing initiatives, multidisciplinary teams and community engagement). However, all these interventions have been delivered in a vertical disease-specific manner.

In addition, although many quality improvement programmes have been implemented both internally and through externally funded projects, there are few studies that have assessed the sustainability of such interventions.

Aim of the study

The aim was to conceptualise an integrated chronic disease management model (ICDM), develop an active implementation model, assess the effect of the ICDM model on operational efficiency and quality of clinical care and determine the sustainability of the ICDM model.

The ICDM model and the results emanating from the research has changed the focus of the South African Government in planning and managing chronic diseases. The ICDM model has been accepted as a platform for service delivery and is to be expanded to the Integrated Clinical Services Management.

"My PhD has largely impacted on my development as a pharmaceutical policy analyst and as a health professional and has strengthened my capacity to contribute to the health care reform of the country."

MS VELISHA ANN PERUMAL-PILLAY

Pharmacist

PhD research: An investigation into the availability of priority medicines for mothers and children in South Africa

Profile

Ms Perumal-Pillay is a pharmacist who joined the Discipline of Pharmaceutical Sciences in January 2012 as a lecturer in Pharmacy Practice. She holds a Bachelor of Science (Honours), Bachelor of Pharmacy and Master of Medical Science (Pharmaceutical Sciences) from the University of KwaZulu-Natal. Her Masters degree in Pharmaceutical Sciences was awarded distinction and focused on the formulation and evaluation of multipolymeric monolayered mucoadhesive films for buccal delivery – a novel drug delivery system.

She is currently credentialing to PhD in Pharmacy Practice. Her research areas are Pharmaceutical policy analysis and access to medicines with a focus on essential medicines for mothers and children. She has been awarded the Medical Education Partnership Initiative REMETH bursary and is also a South African Medical Research Council National Health Scholarship Programme PhD Scholarship holder for the duration of her PhD research. She is a registered pharmacist with the South African Pharmacy Council and is a member of the following local professional bodies: Pharmaceutical Society of South Africa, The South African Association of Hospital and Institutional Pharmacists and The Academy of Pharmaceutical Sciences of South Africa.

Ms Perumal-Pillay on essential medicines

In recent years, the international community has prioritised access to essential medicines focusing on accessibility, availability, quality, and affordability. The World Health Organization (WHO) has further introduced the concept of Priority Medicines for mothers and children, which are defined as medicines with the potential to save lives and should be available in all health care systems, including South Africa's National Essential Medicines List (NEML).

The widespread media reports of drug shortages, poor access to drugs and the global economic crisis resulting in increasing costs of medicines warrants investigation.

The impact of pharmaceutical, pricing and essential medicines policies should be evaluated to determine if the desired effect was achieved or unintended consequences occurred. Furthermore, to ensure the current NEML is in line with WHO guidelines for priority medicines for mothers and children, an in-depth analysis of policies that govern the process of making these medicines available is needed.

The aim of the PhD study is to evaluate the impact of such policies on the availability of a basket of selected essential medicines for both adults and children, in public and private sectors of health care in SA, with a particular focus on priority medicines for mothers and children.

Findings

The findings of the research thus far track the various changes in the NEMLs at two levels of healthcare and describe the evolution of the NEMLs since inception in 1996. This is the first study in SA to investigate changes in NEMLs over time in relation to molecules, dosage forms and therapeutic classes. It is also the first to compare the latest SA EMLs to the WHO Model lists.

The results, therefore, provide insight into the SA EML processes over time. To date, there remains a scarcity of such policy evaluations in SA and expertise in this field of policy analysis is lacking in the country.

"My research has enabled me to develop my teaching abilities, and hopefully will impact on the calibre of medical specialists produced, ultimately improving patient outcomes."

DR CHAUNTELLE BAGWANDEEN
Public Health Medicine Specialist, UKZN

PhD: Assessing the effects and effectiveness of small group tutorials in under-graduate students

Profile

A specialist Public Health Physician, Dr Bagwandeen's passion has always been in teaching undergraduate and postgraduate medical students. "It is vital that our medical students develop an understanding that social determinants of health are as important in improving and preventing ill-health as is the clinical competence in diagnosis and treatment," she says.

Background to the research

Dr Bagwandeen joined the discipline of Public Health Medicine as a lecturer, tasked with the postgraduate Diploma in Public Health Programme as well as co-ordinating the first year Becoming a Professional module. "South Africa post-apartheid was idealistically meant to evolve into a multicultural, multilingual yet egalitarian society. The reality today is somewhat different, as divisions are now based on socio-economic status rather than race.

While innovative solutions were required in many different settings to address past inequities, it was critical in health human resource training, to deal with the cultural diversity of students whilst also equipping them to appropriately and effectively manage the diverse populations they would one day be working with.

Dr Bagwandeen on her findings...

A sound clinical competence to the realities of a diverse patient population and the promotion of high calibre of trainees are some of the areas which can be strengthened through the feedback received during the research.

The Fellowship examination is an external exit examination for registrars, and entails competent presentation, appropriate examination techniques as well as the need to be academically competent. It is disconcerting that although over 90% of the registrars report that feedback is provided in preparation for the examination, this is timeous and adequate only approximately 50% of the time.

Conclusion

Good quality feedback comprising all elements is essential for contributing to the calibre of medical graduates. Information regarding the MMED process should be standardised and made available to the registrar at the commencement of the programme to prevent unnecessary delays as well as clarify what needs to be done. Similarly, a component of disciplined academic days should be formal preparation for the Fellowship examinations, so that the information provided is timeous and adequate enough to prepare the registrars thoroughly. A more in-depth analysis of feedback in the discipline of Surgery should be undertaken to determine the processes present so that these can be shared with the other disciplines.

Feedback in medical education is used to promote high-quality performance in trainees through raising awareness of present skills in high-level performers.

Hence for the purpose of this study feedback is defined as 'information given to supervisees about performance together with an improvement plan in order to achieve the desired end goals.'

In order to achieve clinical competence that will result in optimal patient care and outcomes, trainee errors must be rectified and competencies reinforced, especially in the context of workplace 'experiential' learning that medical students find themselves in. This is what feedback, if properly provided by the supervisor and received by the student, will achieve.

"I hope that the results of my study can be used to inform National and International guidelines in the appropriate management of HIV-infected malnourished children."

DR MOHERNDRAN ARCHARY
Paediatric Infectious Disease Specialist: King Edward VIII Hospital
Study: Early versus delayed HAART in HIV-infected malnourished children

Profile

Dr Archary has extensive involvement in HIV management and holds the position of Co-Chair of the South African National AIDs Council (SANAC) Treatment and Care technical task team and the Paediatric ARV Treatment Guideline committee. His research interests include antiretroviral drug therapeutics, viral resistance and optimal timing of initiation of antiretroviral therapy in the developing world.

Synopsis of Research...

Five million children die worldwide from malnutrition every year. In developing countries, malnutrition remains a common presenting clinical problem in HIV-infected children, and is often the initiating event prompting health care seeking behaviour. The pathogenesis of malnutrition in HIV-infected children is multi-factorial including HIV-associated wasting syndrome, chronic/persistent diarrhoea, the presence of other co-infections and food insecurity. The current standard of care for HIV-infected children is to offer nutritional support with antiretroviral therapy, however, the optimal timing of initiation of HAART is unknown.

The initiation of HAART in malnourished children has been previously associated with higher mortality (Patton, Sangeetha et al. 2006) and delayed immunological recovery (Bandyopadhyay and Bhattacharyya 2008) compared to non-malnourished children. The reasons for these findings are not known, but may be related to altered pharmacokinetics, persistent co-infections, other immunological factors and micronutrient deficiencies.

In developing countries, malnutrition remains a common presenting clinical problem in HIV-infected children, and is often the initiating event prompting health care seeking behaviour.

Findings

Even with optimal inpatient nutritional support, the nutritional recovery may be delayed as long as 4–6 weeks for the most severely malnourished children. It is not known whether these severely malnourished children are capable of absorbing enough of the antiretroviral therapy during the recovery phase. It is possible that sub-therapeutic levels of antiretroviral drugs during this period may lead to drug resistance and the poor long-term outcome. In addition, the co-infection with tuberculosis in many of these children results in additional pharmacokinetic, immunologic and nutritional challenges.

Timing of initiation of HAART and the appropriate nutritional rehabilitation (Mangili, Murman et al. 2006) are thus priorities in the research agenda for developing countries. The results of this study can be used to inform National and International guidelines in the appropriate management of HIV-infected malnourished children resulting in evidence-based guidelines.

"Performing this study has improved my insight and understanding of patient pathology and has humbled me as a humanitarian. Embarking on this journey of research has rendered me complete as a clinician, with the stark reality that treatment of the patient does not end at the bedside."

DR BALA PILLAY
Principal Specialist, Head: Department of Vascular/Endovascular Surgery

PhD: The clinical and histopathological profile of arterial aneurysms and other forms of macro vascular disease in patients infected with HIV

Research overview

The broad aim of this study was to define the clinicopathological profile of HIV vasculopathy based on the hypothesis that HIV-related vascular disease presents a unique clinical and pathological profile that differs from vascular disease in non-HIV infected persons.

Findings

This study was unique in that it is a prospective study aimed at addressing gaps in our knowledge in HIV vasculopathy relating to clinical profile and etiology. There are several inconsistencies in recent literature with reference to the laboratory evaluation as well as documentation of the intraoperative findings and arterial wall sampling for detailed histopathological evaluation.

The study sampling involved multiple sites of the arterial segment in order to define the extent of disease and patterns of involvement. Associations with disease elsewhere have been described and the pathogenetic mechanisms underlying HIV-associated vasculopathy determined by histopathological and immunological examination of resected specimens.

Impact of my PhD

This HIV study on vascular patients has allowed me the opportunity to interrogate arterial and tissue samples in detail and follow this journey to the anatomical pathologist where an entirely different world awaited me with respect to tissue sampling, staining and staring down a microscope to visualise the sampled material at a cellular level.

My supervisors have been a source of inspiration. For those wishing to join the field, there is an abundance of opportunities that may guide one on a journey of inspiration, fascination and mystery, with the realisation that this is only… the beginning.

"I have gained experience in using new data collection methods which together with an improved understanding of obtaining ethical clearance has helped me assist both undergraduate and postgraduate students."

MS DESHINI NAIDOO
Occupational Therapist, UKZN

PhD: Aligning Occupational Therapy Education with Primary Health Expectations: A Multi-Sector Study

Profile

Ms Naidoo's interests are currently in general occupational therapy practice, more specifically neurological conditions, vocational rehabilitation, paediatrics and occupational therapy education. She currently supervises both undergraduate and postgraduate research projects and is an emerging researcher.

Research Journey

There was a need to identify a framework to align the curriculum to a primary healthcare approach due to the primary healthcare re-engineering. However, there was limited research available on the extent to which current occupational therapy training equipped practicing graduates to deliver services that match both the needs of their prospective workplaces, primary healthcare approach and the framework of the SA National Health Insurance(NHI). The aim of the research was, therefore, to develop a contextual evidence base to inform the development of a South African framework of competencies/educational outcomes required to align OT education to primary health care through an exploration of various OT stakeholders within public sector settings of KZN, South Africa.

Methods

This was a descriptive, explorative qualitative study using an interpretivist approach. Purposive sampling was used to recruit participants from the community and healthcare workers (Primary health care nurses and community health workers) in the UGu district, community service therapists and occupational therapists from public sector hospital across KwaZulu-Natal and key informants from the Department of Health.

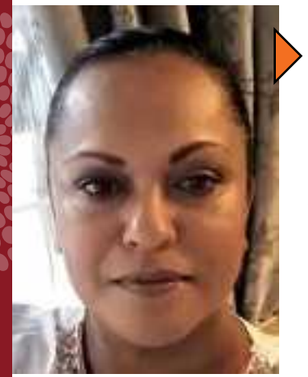
Data was collected using photographs taken by community members, focus groups and semi-structured interviews with community members, healthcare workers, key informants from Department of Health and occupational therapists. The research questions explored the role of occupational therapy in primary health care, how government policies and the Department of Health perceive the role of OT in primary healthcare and the perceptions of training for PHC and competencies required to work within a primary healthcare approach. The data was analysed thematically.

Findings

This study outlined the community's, healthcare workers expectations of the rehabilitation services and occupational therapists perceptions of the services provided at a PHC level which contributed to an understanding to the role of OT in PHC. The analysis of health policies and Department of Health's expectations of occupational therapy services and undergraduate training provided guidelines for undergraduate training and the expectations of the department of health. The community service therapists and the occupational therapy perceptions of their preparedness for PHC and the competencies required to deliver a PHC service provided insight into the changes required within the occupational therapy curriculum to align OT education with primary health care.

Conclusion

A framework will be created using the data from the different stakeholders to guide the curriculum review and provide strategies to align OT education with primary healthcare.



"The PHD has been one of the most challenging things I have done in my life. It has opened up areas of myself that I did not know were there."

MS THAVANESI GURAYAH
Occupational Therapist, UKZN

PhD Research: To Flourish or Fail in Higher Education

In her own words

The aim of this exploratory study was to develop and test a 6-week intervention aimed at improving the wellbeing and psychological capital of first year Health Science students at UKZN. In addition, the stability of the constructs was examined over a year, and the effect on academic performance was observed.

A quasi-experimental mixed methods design was utilised. Students from the disciplines of Occupational Therapy, Physiotherapy, Speech-Language Pathology and Audiology of the 2014 cohort were invited to participate in the research. 88 students showed their willingness to participate in the research, but there was attrition over the year that the study took place. The final sample comprised 35 students from both the control and intervention groups.

There were 7 questionnaires administered to the students which included a biographical questionnaire, Psychological Scales of Wellbeing, Psychological Capital questionnaire, Procrastination scale, New Generation Self-Efficacy Scale, SEER (social efficacy in enlisting resources) Scale and Study Methods questionnaire.

Findings

The study showed that the students were responsive to the intervention, and felt that it was a forum to air their concerns. They enjoyed the format which was a short powerpoint presentation or video followed by discussion, and not another lecture! They felt that it could potentially benefit all first-year students, and should be done in the first semester. They felt that the lessons learned was how to prioritis e, manage their time and they gained insight into the type of learners they were, and studied in accordance with their learning styles.

In addition, they learned how to access help from peers and lecturers, and felt they had become more confident and assertive in the process.

Through the intervention, they also learned cognitive strategies such as positive thinking, goal setting and how to be resilient students.

Conclusion

This research looks promising as a programme for first-year students, and can be done during orientation week. It will deliver some critical skills needed for success in Higher Education. It will be of interest not just to first-year university students, but counselors and management as well.

On a personal level, I have, through the PhD, experienced personal and professional growth on an unprecedented scale. It has been a frustrating and exciting process, and I have learned discipline and how to write critically and interpret statistics more confidently. As a result, I will also be able to supervise post-graduate students more confidently.

"I am grateful to MEPI for providing experts for guidance in all fields of research, which has assisted me in the PhD."

DR FELIX ONANKOY ATSHAKALA ONYANGUNGA
Specialist Obstetrician and Gynaecologist
PhD: The role of lymphangiogenesis in the placenta and placental bed of HIV-associated pre-eclampsia

Profile

Dr Felix Onyangunga was born in the Democratic Republic of Congo where he graduated from the University of Kinshasa with a medical degree (MBCHB) and a postgraduate degree in Masters of Medicine (Obstetrics and Gynaecology) in 1983. In 1991, Dr Onyangunga together with his family emigrated to South Africa where he has been working with the Department of Health.

About his PhD

The aim of the research was to examine lymphangiogenesis in the placenta and placental bed. Placenta (post delivery) and placental bed samples (caesarean section) were obtained from HIV negative and positive normotensive and pre-eclamptic patients.

Results so far have shown lymphangiogenesis occurs in the syncytiotrophoblast in the placenta as well as the placental bed.

In addition, there was a significant difference in the LYVE-1 expression in the exchange villi between the HIV-uninfected and infected group ($p<0.004$); between normotensives and preeclamptic ($p<0.001$).

Scientific articles emanating from this research work have been presented at local and international conferences.

Credits for assistance in his PhD

Dr Onyangunga says he has gained key clinical research knowledge from his PhD, including good clinical practice, how to write a protocol, how to interpret results and reasoning meaningful outcomes and how to write scientific papers.

He also credits some of the experts in assisting him during the course of his PhD, including his supervisors, Professor Jack Moodley and Associate Professor T Naicker for their contributions and support during the course of his research.

"The PhD has been a journey of learning for me, not only with regards to knowledge of adolescent mental health, but also in understanding the process of research, statistics, improving my writing and learning to know myself better."

SAEEDA PARUK
Specialist Psychiatrist

PhD: The significance of cannabis use and family history of mental illness on the clinical characteristics of first episode early onset psychosis in KZN

Overview

Early-onset psychosis is the onset of psychosis by age 18. A family history of mental illness and cannabis use are established risk factors in the development of psychotic disorders. The aims of this research were to report on the association between the risk factors and clinical variables in adolescents with first episode early onset psychosis and compare them to adolescents with other first episode non-psychotic mental illness.

Findings

The adolescents with EOP had several negative outcome indicators, such as poor recognition of the prodrome period, longer DUP especially in younger children, high symptom severity, high prevalence of cannabis use and early age of symptom onset, which all suggest the need to initiate early intervention services with a focus on dual diagnosis. Early cannabis use was also more significant in influencing DUP (but not statistically) than lifetime cannabis use. There were also significant gender differences in substance use patterns and clinical presentation.

Lifetime cannabis use (55% prevalence) was associated with urban living, higher family income, greater symptom severity and increased risk of nicotine and alcohol use. Lifetime cannabis use was not associated with age of onset or DUP.

Early cannabis use before age 14 was associated with a longer DUP. It thus appears that age of first cannabis exposure is more significant than lifetime cannabis use history.

Family history of mental illness, in general, was not associated with any clinical variables. The results thus suggest that a FHP in first degree relatives has significant diagnostic and clinical relevance. The results of this study are contrary to the previous literature and suggest that FHP is not necessarily associated with negative clinical characteristics at disease onset in EOP.

EOP adolescents had increased current cannabis use, more frequent use and more problematic use. The differences in socio-demographic variables reflect the marked disparity in access to mental health care for rural Black youth from lower socio-economic backgrounds who only receive care if they have severe mental illness such as psychosis. The cannabis use patterns suggest that psychotic youth are more vulnerable to comorbid cannabis-related problems than other mentally ill adolescents.

Conclusion

The key results of high comorbid substance use in adolescents with mental illness, the negative impact of cannabis use on symptom severity and DUP and the more hazardous cannabis use in adolescents with EOP suggests a need for urgent dual intervention services that address psychiatric and substance-related problems in an integrated health care system.

"The PhD has been extremely useful in assisting me to gain confidence as a clinician-researcher."

DR DIBUSENG RAMAEMA
Radiologist, UKZN Head, Department of Radiology

PhD: Radiologic evaluation of breast disorders related to TB amongst women in Durban

Overview

Breast Tuberculosis (BTB) is uncommon, but not rare. Knowledge of the ways in which it can present can prevent unnecessary invasive procedures and delay in diagnosis.

Aims and objectives

PRIMARY AIMS

- To assess the prevalence of breast tuberculosis amongst patients presenting to a surgical service with breast abnormalities
- To study breast abnormalities in TB patients
- To describe the radiological abnormalities associated with breast TB
- To assess the response of breast TB to therapy.

Materials and Methods

PHASE 1 The retrospective cohort was conducted by analysing the records from 2000-2013, resulting in analysis of 65 patients with BTB.

PHASE 2 The prospective cohort was achieved by recruiting patients with pathologically proven breast tuberculosis. The patients underwent a FDG PET-CT and MRI scans at diagnosis. The follow-up scans were timed at approximately 4 months after initiation of anti-tuberculous treatment.

PHASE 3 Combined prospective/retrospective cohort. Comparison of phase 2 studies to the breast cancer cases. The retrospective cohort was obtained by analysing records of patients with breast cancer who underwent similar radiological investigations scans during the study period.

Knowledge of the differentiating features [between breast cancer and BTB] would benefit the common misdiagnosis of BTB which leads to delayed treatment, with potentially significant complications.

Conclusions

Based on the analysed results, we can provide the radiological patterns of BTB with various imaging modalities. We can further suggest the potential biomarkers for treatment response evaluation, which can be further explored in a larger cohort or multi-centre studies.

Phase 3 of the study evaluated differences between breast cancer and breast tuberculosis. Therefore, knowledge of the differentiating features would benefit the common misdiagnosis of BTB which leads to delayed treatment, with potentially significant complications.

Impact of the PhD on my development

The study has been very challenging but enjoyable at the same time. It has been extremely useful in assisting me to gain confidence as a clinician-researcher.

Having been a REMETH-MEPI candidate provided research support, not only financially, but also in the workshops that were provided. It has given me a competitive urge as an academic and enhanced my research supervision skills so that I can help the MMED students efficiently.

"The PhD has assisted in improving my research skills in a number of areas, including the application of grants, ethics approval and literature search."

DR KHINE SWE SWE HAN
Specialist medical microbiologist: National Health Laboratory Service

PhD: A novel standardised approach to the treatment and management of significant Acinetobacter species infection in KwaZulu-Natal

Overview from Dr Han

This study proposes to determine the prevalence of A.species infections and drug susceptibility profiles in KZN Academic Complex Hospitals by a retrospective chart review. To develop an algorithm for a standardised approach for the treatment and management of significant A.species infection, effective drug combinations against A.species, and clinical and laboratory outcomes of Acinetobacter infected patients after appropriate treatments will be determined. This study may offer a new perspective on the control of this global public health threat.

Background

A significant proportion of nosocomial isolates including multidrug resistant Acinetobacter species continues to be seen in the academic complex hospitals of KwaZulu-Natal. Despite an exponential rise in A.baumannii infections over the past decade, many questions remain unanswered. The dearth of available treatments remains a major concern and further work on the use and efficacy of combination therapies is warranted. This problem is compounded by the lack of a standard approach to treatment and management of A.species infection.

Findings

- Our findings highlight the impact of antibiotic stewardship in the treatment of patients in whom A. species is isolated and the urgent need for the development of standardised guidelines for management of patients with A. species sepsis.
- With the prevalence of MDR- and XDR-A baumannii having increased over the past seven years, with PDR strains emerging, the study showed that clinical and microbiological indicators of sepsis need to be developed to avoid over and under treatment in order to impact global health.
- Our findings suggest that synergy for combination therapy should not be prescribed as empirical therapy on standard of care, and that synergy testing should be routinely performed for A.baumannii isolated from each patient for individualised therapy.

The dearth of available treatments remains a major concern and further work on the use and efficacy of combination therapies is warranted.

ANUSHKA AJITH

Lecturer, Optics and Imaging Centre

PhD: The role of peripheral natural killer cells in immuno-compromised pre-eclamptic and normotensive pregnant Black South Africans

Profile

Anushka Ajith is involved in the undergraduate MBCHB and HPHS teaching programmes where she lectures in Histology and Physiology. Her interest is in placental research and she currently supervises and co-supervises three postgraduate Master of Medical Science students.

About the research

HIV and pre-eclampsia are the leading causes of maternal morbidity and mortality in South Africa. The effect of HIV on natural killer (NK) cells and peripheral NK cells in pre-eclampsia is not well documented. This study attempts to elucidate the role of peripheral NK cells in HIV-associated pre-eclampsia. Blood samples will be obtained from pre-eclamptic (early and late onset) and normotensive pregnant Black South Africans infected and uninfected with HIV at Prince Mshiyeni Memorial Hospital, KwaZulu-Natal to determine the role of NK cells in HIV-associated pre-eclampsia.

Anushka was awarded the **Y.W. Loke New Investigator Award** at the EPG/20th IFPA Meeting in Paris, France and in January 2015 achieved first prize for her poster presentation at the Malaysian Society of Hypertension in Kuala Lumpur, Malaysia.

In an attempt to understand the maternal immune response in HIV-associated pre-eclampsia, this study will use multiplex enzyme-linked immunosorbent assay (ELISA) to compare the maternal serum levels of Th1 and Th2 cytokines in HIV-infected and non-infected pre-eclamptic (early and late onset) with normotensive pregnant Black South Africans and to determine the correlation of these cytokines across all six patient groups. The role of NK cells in HIV-associated pre-eclampsia and their correlation with a panel of cytokines will also be determined.

HIV and pre-eclampsia are the leading causes of maternal morbidity and mortality in South Africa.

DR RAY MAHARAJ

Specialist Obstetrician and Gynaecologist: Prince Mshiyeni Memorial Hospital, Durban

Research Study: Immunoregulatory mechanisms in pregnant women with pre-eclampsia (HIV positive and negative)

Profile

Dr. Maharaj is also Head of the Department of Obstetrics and Gynaecology, which houses one of the largest maternity units in South Africa. In addition, he is involved in the teaching of undergraduate and postgraduate students from the University of KwaZulu-Natal. His interests include preeclampsia, HIV and maternal and perinatal morbidity and mortality.

Dr Maharaj on Pre-eclampsia

Pre-eclampsia is unique to pregnancy and is defined as the de novo onset of hypertension occurring after 20 weeks of gestation. The etiology of pre-eclampsia remains unknown despite extensive investigation over many years and treatment remains empiric, cured only by the delivery of the fetus. Environmental and genetic factors may play a role in the etiology, through the modulation of placental and maternal factors, thereby contributing to the development of the disease. Demonstration of the involvement of the maternal immune system may give credibility to the immunogenic theory, which is implicated in the pathogenesis of pre-eclampsia. In this regard, there is epidemiological evidence relating to pre-eclampsia, primiparity and co-habitation however research on the underlying immunological basis is ongoing, given the complexity of the immune system and the physiologic immune modulation occurring in pregnancy.

HIV is a major health burden in South Africa and sub-Saharan Africa. Its manifestations are under-pinned by immunological changes that are further modified by HAART. Currently, there is no consensus on the immunological relationship between preeclampsia and HIV, as data on the risk of developing preeclampsia is controversial and research on clinical parameters is lacking.

There is general consensus, however, that the immune-modulatory mechanisms involve complex cross-talk between the innate and adaptive immune systems, cytokines, chemokines, and various other mediators of inflammation.

Preeclampsia and HIV are both major health burdens associated with significant maternal and peri-natal morbidity and mortality, especially in lower and middle-income countries. In this ongoing investigation, we will investigate and comment on the complex immune interrelationships that occur in these conditions, which may contribute the development of novel therapeutic interventions.

The investigation is likely to be completed in the forthcoming year.

"What sets the MEPI initiative apart is the focus on 'doing' rather than 'talking'. The data capturing, analysis and scientific writing workshops were all hands on and practical and I am a better supervisor for having been able to improve my own research skills."

DR SHAMIMA SALOOJEE
Head, Psychiatric Unit: King Edward VIII Hospital
PhD Research: Metabolic Syndrome and Severe Mental Illness in Ethekwini

Why mental illness?

The psychiatric unit at King Edward VIII Hospital is one of the oldest in Durban and was the only general hospital psychiatric unit in Durban for black Africans in the apartheid era. The unit has a high service load and the HIV epidemic placed a massive strain on the limited resources. In tandem with the HIV epidemic, there is an increasing prevalence of non-communicable diseases in Sub-Saharan Africa because the region is experiencing one of most rapid rates of urbanization and demographic transitions globally.

Treating medical illnesses in patients with established psychiatric illness led me to develop an interest in the physical health of patients with severe mental illness (SMI). The mental health of mentally ill individuals in Africa is generally under-researched but there is very little information on the physical health of individuals with SMI from Sub-Saharan Africa. An international meta-analysis found the less than one percent of global research on physical illnesses in patients with SMI originated from Africa.

An international meta-anaysis found that less than one percent of global research on physical illnesses in patients with SMI originated from Africa.

My PhD Journey

My research began with a proposal for a study to determine the prevalence, incidence and risk factors for metabolic syndrome in South African patients with SMI. I planned to conduct two studies within the scope of the project. The first study employed a cross-sectional design to determine the prevalence of the metabolic syndrome in patients with SMI and the second study was a prospective cohort study to determine the incidence and risk factors for the metabolic syndrome in a group of treatment naïve patients with a first episode of SMI. I am fortunate to have two well respected and internationally recognised experts in their fields supervising my work. Professor Ayesha Motala, the Head of the Department of diabetes and endocrinology is my primary supervisor, and my co-supervisor, Professor Jonathan Burns is Head of the Department of Psychiatry.

After my study protocol was approved, I found myself literally between a rock and a hard place. The enthusiasm of having had the protocol approved was soon replaced with the cold reality of securing sufficient funding. But for the MEPI 2012 PhD programme funding, I am sure the project would have progressed rather slowly.

The MEPI Difference

There are a number of university and college-wide support initiatives for PhD students, but many of these are essentially motivational in nature. What sets the MEPI initiative apart is the focus on 'doing' rather than 'talking'. The data capturing, analysis and scientific writing workshops were all very practical. I am also supervising three masters students, and I am a better supervisor for having had the opportunity to improve my own research skills. I am also grateful for the invaluable support of the MEPI staff, especially Aruna Sevakram and Nisha Nadesan-Reddy, whose direct contact has been very refreshing and progressive.

"My PhD reminded me of the value of inter-professional health-care teams and the complex process of exchange, interaction and co-creation of knowledge – all towards the central goals of providing the best possible care for those we serve."

MS PRAGASHNIE NAIDOO
Occupational Therapist
PhD: Development of a Clinical Algorithm for the Assessment of Hypotonia in Children

Profile

Ms Naidoo is currently a lecturer within the Discipline of Occupational Therapy. Her interest is in general occupational therapy practice with a focus on physical and paediatric practice areas. Prior to her entry into academia, she worked in both public and private health sectors. She has a growing passion for research and enjoys supervision of both undergraduate and postgraduate research with an interest in mixed methods and qualitative methodologies. She is currently an emerging researcher, with 11 peer reviewed publications and approximately 20 conference presentations both nationally and internationally. She has also engaged in other professional activities, for example, has served on a number of scientific committees, review panels and committees and is current chairperson of the KZN branch of her professional society. Following the completion of her PhD, she has aspirations of developing herself as a relevant researcher and academic.

About her PhD

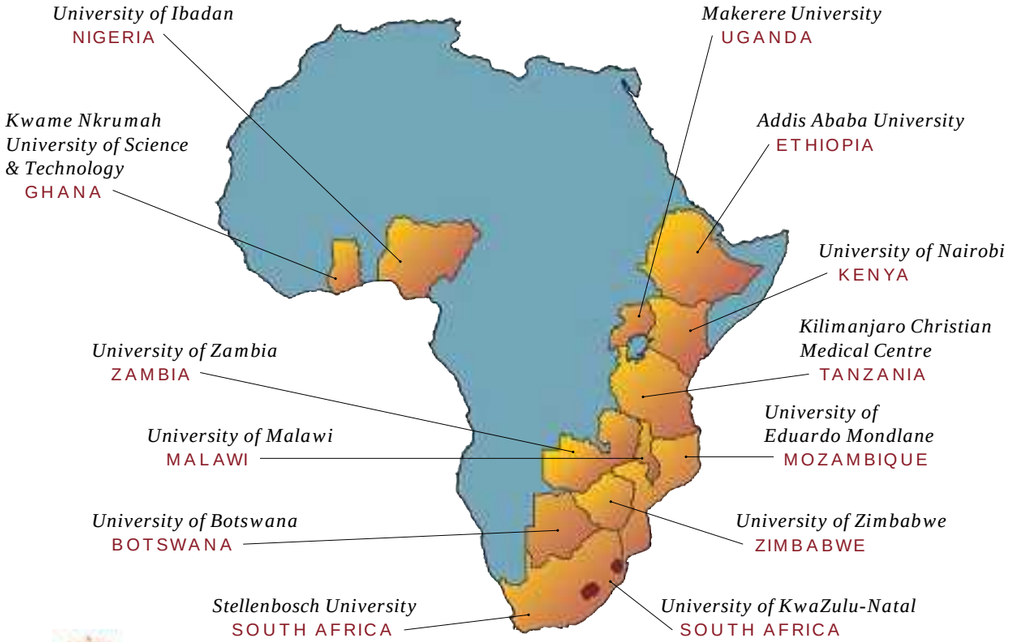
Having joined the programme in June 2014, Ms Naidoo was also afforded the financial support that assisted in early dissemination of findings at a conference in Barcelona, Spain. "I also found the opportunity of a Qualitative Research Module (offered as part of the Masters in Public Health) for non-degree purposes exceptionally useful," she says.

The clinical assessment of hypotonia remains contentious and continues to pose dilemmas for clinicians, given that the presentation of hypotonia can be either a benign or malignant sign. Currently, there are no standardised assessment tools for children (after infancy) and the incidence is difficult, given that it is a symptom of a number of conditions or disorders. There is a need for the scientific community to establish a level of consensus on the initial clinical assessment of hypotonia and move towards more accurate assessment and diagnosis to implement appropriate management.

This study was thus aimed towards the development of an evidenced-based clinical algorithm to aid more accurate and informed decision-making during clinical assessment of hypotonia in children. An advanced mixed methods design within a pragmatic stance was adopted. Phases included a systematic review; a formative needs assessment, a consensus process and development and refinement of a clinical algorithm followed by pre-validation processes. Clinicians and paediatric researchers formed part of criterion-based purposive samples at different phases of the study. Data from the various phases were analysed either descriptively or via content analysis with attempts at leveraging integration of data sets where possible.

Findings

The study has culminated in a clinical algorithm for practice, with feedback on its clinical utility also being achieved; the purpose of which is to assist clinicians in a stance towards more objective and accurate clinical diagnosis and referral planning for early intervention. Findings of this study speak to the need for more evidenced-based assessment and interventions as well as addressing the global health need of early detection and intervention, advancing the attainment of goals related to child health.



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