

Lesotho Medical Journal



Cover photo:

The Minister of Health, Hon Semano Sekatle, "Turns the Sod" marking the start of the construction of the USAID ASHA Funded Lesotho Boston Health Alliance (LeBoHA) Post Graduate Training Campus in Leribe.

In this Edition

| | |
|--|-----------|
| Table of Contents | 3 |
| Message From the Editor..... | 4 |
| Radiance Ogundipe | |
| Information for Authors | 5 |
| Radiance Ogundipe | |
| Update on the Lesotho National Medical Internship Program | 6 |
| Elizabeth Nonkosi Tlale, Lisebo Mojaje, Norbert Chale Moji, Paballo Lethunya, Moipone Molapo, Elizabeth Limakatso Nkabane-Nkholongo, Sebaka Malope, Brian W. Jack | |
| Health System Strengthening Using Problem Solving for Better Health® in Lesotho..... | 6 |
| Grace H. Yoon, Shannon N. Ogden, Elizabeth Limakatso Nkabane-Nkholongo, Mantoetse Jobo, Chelsea M. McGuire, Sebaka Malope, Pamela Hoyt-Hudson, Barry H. Smith, Brian W. Jack | |
| A Synopsis of Hypertensive Disorders of Pregnancy..... | 23 |
| Radiance Ogundipe | |
| Contributing Factors to Pregnancy Induced Hypertension at Quthing Government Hospital..... | 27 |
| Amelia Mashea, Mpolokeng Maliehe | |
| Advertisements | 33 |

From the Editor

Reflections on the Covid-19 Pandemic: Are There Lessons for the World and Lesotho?

Radiance Ogundipe, MD,^{1,2}

1. Lesotho-Boston Health Alliance, Florida 567, Maseru West 105, Kingdom of Lesotho
2. Lesotho Ministry of Health/Lesotho-Boston Health Alliance (LeBoHA) Family Medicine Specialty Training Program

Corresponding author: Radiance Ogundipe email: rogundipe@leboha.org.ls

Although the Covid-19 pandemic started as an epidemic in Wuhan, China towards the end of the year 2019, by the second quarter of 2020, it had spread globally with just a few countries, including Lesotho, spared of the earliest wave. As waves swept through the global community, many isolation and intensive care units were stretched beyond their maximum. Governments across the globe responded with lockdowns to stem the ravaging infection. International travel became difficult as countries tried to prevent travelers from bringing emerging variants into their country. Schools were closed and economies were adversely affected by border restrictions. Industries relying on tourism ground to a halt. What lessons can we learn as we hopefully begin to emerge from this gloom?



Manufacture of Ventilators in South African hospitals. The reported manufacture of ventilators locally by engineers in South Africa in response to increased demands for them in the management of patients with severe Covid-19 disease is a lesson in resourcefulness and adaptation of knowledge to meet the exigent demands. Engineers and scientists in South Africa, a developing country, rose to the health challenges of the Covid-19 pandemic. Working in silos as is the norm with different professions should be discarded as part of the response to emergencies at all levels. A collaborative approach from different professional paradigms may be the pragmatic approach rather than passively expecting support from the industrialized countries.

Information Management. There has been a deluge of misinformation during this pandemic and this should be a global concern. All sorts of unfounded claims continue to circulate, with some unfortunately originating from health professionals who are expected to be guided by the Hippocratic Oath to speak truthfully and for the public good. These spurious claims fueled a high level of vaccine hesitancy that has been rampant since the advent of the Covid-19 vaccines. There is an urgent need to ensure accurate information is being shared on virtual media platforms. Freedom of expression should not obviate accountability for what is expressed. Those who wield considerable influence in society should be held accountable when they propagate misinformation.

Virtual Meeting Platforms. The pandemic has led to a shift in the way we organized social and educational interactions. Restrictions on the gathering of crowds have led to the improvement and strengthening of online platforms and made it evident that many meetings, educational activities, and conferences can be conducted virtually instead of only via conventional physical gatherings. This is a welcome development that should be enhanced and continued even beyond the pandemic.

Global community. The pandemic has increased the global connectedness of countries around the world. It showed that events in one country have the potential to affect the entire world in a short time. Nations should collaborate on an approach to challenges faced by individual countries rather than the parochial attitude such as was evidenced by the vaccine hoarding by some affluent countries. When we overlook the concerns of seemingly inconsequential countries, we risk exposing the rest of the world to devastating consequences.

Sincerely,

Radiance Ogundipe

Instructions for Authors of the *Lesotho Medical Journal*

How should I submit an article for the Next Edition? The next edition of the *Lesotho Medical Journal* (LMJ) is scheduled to be released in September 2022. For consideration and to allow time for peer review and printing, please submit your article by July 15, 2022 by email to Dr. Radiance Ogundipe - rogundipe@leboha.org.ls. Please include a cover letter, the manuscript, and any figures/tables (maximum 5) as separate documents.

What kind of articles do we publish? The *LMJ* publishes the following types of articles:

1. Commentaries – Discussion of current topics in health - maximum 500 words
2. Clinical Case Reports – reports of clinical cases that we can learn from - maximum 1,000 words
3. Original Research – maximum 3,500 words (exemptions for qualitative research that could be more)
4. Letter to the Editor – to make a comment on previous publications - maximum 400 words
5. Community Oriented Care Field Reports – maximum 3,000 words
6. Systematic Reviews – critical synthesis of research related to a clinical topic – maximum 3,500 words
7. Essays – Reflections from clinicians, patients, families, communities, and policymakers
8. New innovations in Medical Education or Clinical Care– Succinct stories of on-the-ground innovations
9. Photographs – Each edition will include a few photographs. Photos related to the Mountain Kingdom are most welcome.

How will the submission be reviewed? The editor and two members of the Editorial Board will review each submitted manuscript. Articles will be accepted, rejected or the authors will be provided specific feedback and asked to revise and resubmit the manuscript. In the future, we are planning a more formal peer-review process. The details will be published in future editions of the *Journal*.

How should the manuscript be prepared? In general, manuscripts should be prepared according to guidelines described in the ICMJE's Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals. <http://www.icmje.org/recommendations/>

Is there a fee for publishing in the *LMJ*? No, and the authors retain copyright to their published article.

Is advertising accepted by the *LMJ*? Yes, we now are accepting advertising in order to partially cover the cost of publication. Current advertising costs are:

- a. Full page M5,588
- b. Half page M2,759
- c. Quarter page M1,379

Is there a Conflict of Interest Policy? Yes, all authors of accepted manuscripts will be required to declare relevant conflicts of interest.

Can I see previous editions of the *Journal*? All previous editions of the *Lesotho Medical Journal* (formerly the *Lesotho Medical Association Journal*) are now available online and can be freely downloaded at <https://www.leboha.org.ls/journals.php>

Update on the Lesotho National Medical Internship Program

Elizabeth Nonkosi Tlale, MBChB, MMedO&G,¹ Lisebo Mojaje MBChB, FM Specialist,^{2,3} Norbert Chale Moji, MBChB,⁴ Paballo Lethunya, MPhil,^{2,5} Moipone Molapo, BCom,² Elizabeth Limakatso Nkabane-Nkholongo, RN, MPH, PhD(c),^{2,3,6,7} Sebaka Malope MBChB, FM Specialist, MMedEd, PhD(c),^{2,3,6,8} Brian W. Jack, MD^{2,3,6}

1. Ministry of Health, National Medical Internship Program, Kingdom of Lesotho
2. Lesotho-Boston Health Alliance, Maseru, Kingdom of Lesotho
3. Lesotho-Boston Health Alliance (LeBoHA) Family Medicine Specialty Training Program
4. Lesotho Medical, Dental, Pharmacy Counsel, Maseru, Kingdom of Lesotho
5. University of Stellenbosch, Republic of South Africa
6. Boston University School of Medicine Boston, Massachusetts, USA
7. Sefako Makgatho University, Department of Health System Management and Policy, Pretoria, Republic of South Africa
8. University of the Free State, College of Health Sciences, Bloemfontein, Republic of South Africa

Corresponding author: Dr. Tlale email: ntlale@leboha.org.ls

ABSTRACT

BACKGROUND. In 2015, the Ministry of Health, with support of Cabinet, passed a resolution requiring medical students studying abroad to return home to complete a two-year medical internship. This report provides an update of the activities and outcomes of the first three years.

METHODS. In April 2019, the Ministry of Health and the Lesotho Medical, Dental and Pharmacy Council collaborated with the Lesotho Boston Health Alliance to organize and strengthen the newly designed “Lesotho Medical Internship Programme”. The Goals of the Programme are to equip interns with the knowledge, skills and attitudes to prepare them to competently serve in Lesotho’s district hospitals and community health centers, and to retain Basotho doctors to work in the country after they complete the Programme. Significant effort has helped to strengthening the administrative processes, intern oversight and rotation sites and supervisor skills.

RESULTS. Overall, 136 medical students matriculated in the Internship Programme after completing medical school in 8 different countries. Forty-nine have completed the 2-years programme; 45 continue to work in Lesotho and 34 work for the Government of Lesotho.

CONCLUSION. The Lesotho Medical Internship Programme is re-established and on a solid foundation for the future. The interns express a positive outlook towards programme, and many administrative processes are set-up.

INTRODUCTION

There has been an internship program in Lesotho for more than 50 years that took place primarily at the Queen Elizabeth II Hospital that at that time was the referral hospital based in Maseru and then later Queen ‘Mamohato Memorial Hospital (QMMH) became the site of the internship program. During those years, all Basotho medical doctors were trained in other countries and the tuition and

associated costs were paid for most by the Government of Lesotho. Most of these students completed internship abroad and very few returned home, especially those who trained in South Africa.

In the early 2000s as the extent of the HIV epidemic became evident,¹ it became increasingly clear that the number of physicians practicing in the country was not adequate to care for the health needs of the population. In 2009 it was reported that there

were only 130 physicians in the country, representing 1 physician for over 20,000 people, and of those, only 30 were Basotho – and 80 percent of Basotho physicians were practicing in Maseru.^{2,3}

As part of the effort to increase the number of physicians and to establish a medical school,⁴ between 2012 and 2016, the GOL arranged for 106 students to attend medical school in Zambia (32 students) and Zimbabwe (74 students), and more were being sent to South Africa and elsewhere.

In 2016, SADC countries resolved that member states should send graduates back to their countries for internship. This resulted in increasing calls for the GOL to set up programs to incentivize the students attending medical school outside the country to return home. In 2015, the Ministry of Health (MOH), with support of Cabinet, passed a resolution requiring medical students to return home to complete their internship. Those that returned home would have half of the costs of their medical education forgiven. Otherwise, they would be responsible for re-paying the full costs.

These young doctors were a critical national resource and bringing them back home was a critical step toward strengthening the nation’s health system.

The Lesotho MOH in collaboration with the Lesotho Medical, Dental, and Council (LMDPC) reorganized the internship program that would be able to accommodate the number of interns expected to return home. In April 2019, the MOH and the LMDPC collaborated with the Lesotho Boston Health Alliance (LeBoHA), as the only postgraduate medical education institution in Lesotho, to organize and strengthen the newly designed “Lesotho Medical Internship Programme”.^{5,6}

This report provides an update of the activities and outcomes of the first 3 years of this collaboration.

STRUCTURE OF THE EDUCATIONAL PROGRAM

Programme Goals and Objectives. Early in the development of the programme, the Goals and Objectives were articulated.

The goal is to retain most of the Basotho medical and dental graduates who have completed the internship to work and serve in their country.

The programme objectives are to equip medical and dental interns with the knowledge, skills and attitudes to prepare them to competently serve in Lesotho’s district hospitals and community health centers; and to strengthen capacity of the Lesotho Medical Dental and Pharmacy council (LMPDC) to take the leadership role in the re-designing of the Lesotho Internship Program.

Intern Orientation. All interns are oriented to the program before going to the different clinical sites where they receive department specific orientation. The President of the LMDPC, the Director General of Health Services and Director of Human Resources of the Ministry of Health participate in the orientation. Sometimes, if schedule allows the Minister of Health and Principal Secretary visit to welcome the new doctors to thank them for their service to the health care system and people of the Mountain Kingdom.

| Table 1: Internship Teaching Sites and Rotations | | |
|---|-------------|---|
| Rotation Site | District | Rotations Taught ¹ |
| Botha-Buthe Hospital | Botha-Buthe | FM |
| Motebang Hospital | Leribe | FM, Peds, Surg, OBG |
| Maluti Hospital | Berea | OBG |
| QMMH Hospital | Maseru | IM, Peds, OBG, Surg, Anes, A&E, Eye,,Ortho, ENT |
| Mafeteng Hospital | Mafeteng | IM, OBG, Eye |
| Mokhotlong Hospital | Mokhotlong | FM |
| New Queen Elizabeth Hospital ² | Maseru | Peds |
| Baylor Children’s Foundation Lesotho | Maseru | Peds |
| Footnotes. | | |
| 1. Abbreviations: FM - Family Medicine, Peds – Pediatrics, Surg – Surgery, IM – Internal Medicine, OBG – Obstetrics and Gynecology, ENT – Otorhinolaryngology), Eye – Ophthalmology, A&E – Accident and Emergency, Anes – Anesthesia, Ortho – Orthopedics | | |
| 2. Planned when construction completed | | |

Table 2. Logic Model for Lesotho National Internship Programme Monitoring and Evaluation

| Table 2. Logic Model for Lesotho National Internship Programme Monitoring and Evaluation | | | | | | |
|---|---|--|--|--|---|--|
| Goal | To retain all Basotho medical doctors graduates outside of the country to work and serve their country | | | | | |
| Inputs | Activities | Outputs | Short-term Outcomes | Mid-term Outcomes | Long-term Outcomes | Indicators |
| <ul style="list-style-type: none"> • Funding • Personnel (Director, Coordinator, Admin, Finance, M&E) • Stationery • Transport • Accommodation for interns • Rotation sites | <ul style="list-style-type: none"> • Capacity building for supervisors • Supervision • Evaluation assessment • Workshops • Lectures • DQAs • Admin for rotations • Guideline development • Council Reports | <ul style="list-style-type: none"> • Rotations supervision conducted • Rotations completed • Guidelines developed • Assessment conducted | <ul style="list-style-type: none"> • Increased knowledge in practical medicine • Able to assist and perform procedures | <ul style="list-style-type: none"> • Competent and safe medical practitioners • Improved insight understanding and experience in patient care • Increased devotion in practicing medicine in home country | <ul style="list-style-type: none"> • Retention of Basotho physicians | <ul style="list-style-type: none"> • Number of interns enrolled • Number who have passed all rotations • Number of interns who complete internship • % of interns who work in the country after internship |
| Assumptions | | | External Factors | | | |
| There should be a supervised 24-month training for newly qualified Medical Doctors before they can register as independent medical practitioners | | | <ul style="list-style-type: none"> • Strikes/Political Instability • Outbreaks that may prolong the program • Continuation of the programme | | | |

Internship Rotations. The Programme requires interns to complete nine individual rotations of varying lengths in the 24-months of training. LeBoHA organizes the annual schedule of rotations.

The required rotations are Family Medicine (4 months), Internal Medicine (4 months), Pediatrics (3 months), Surgery (3 months), OBstetrics and Gynecology (5 month), Orthopedics (2 months), Accident and Emergency Care (1 month), Anesthesiology (1 month), and combined Ophthalmology and Otorhinolaryngology (1 month). There is not a psychiatry rotation as there is currently no psychiatrist in the country.

Internship Training Sites. Table 1 shows the rotation sites and the clinical specialties taught at each site. There are eight LMDPC recognized hospitals and clinics identified as internship rotation sites across the six different districts.

Transitions to New Rotations. Interns rotate to the different rotation sites at the end of each rotation. LeBoHA organizes the logistics for transportation to new sites. On the last day of the rotation, the LeBoHA driver meets the interns and drives them to their next rotation.

Salary and Housing. Upon enrollment into the government system, interns receive housing allowance and a stipend at a grade appropriate for their level of service.

Supervision of Interns at Rotation Sites. The supervisors named at each clinical training site are the core clinical teachers of the internship program. They transform theory into experience and skill development, and have an opportunity to model for the interns a high degree of professionalism and a strong work ethic. The supervisor is responsible for ensuring that a more senior clinician oversees the intern’s work at all times. The program depends on them for good judgement in the evaluation of interns. The supervisor’s responsibilities are to:

- Welcome and orient the intern to the activities of the department or unit
- Explain the intern job description to the intern
- Draw up duty roster for the interns
- Oversee the day-to-day needs of the intern and handle minor complaints
- Be available to organize sick leave and overtime duties where applicable

| Table 3: Demographics of Interns Enrolled Since April '19 n=136 | | |
|--|----------------|------------|
| Age (mean years) | | 31.0 |
| Nationality (#,%)¹ | Mosotho | 135 (99.9) |
| | Other | 1 (0.01) |
| Sex (#, %) | Male | 53 (39%) |
| | Female | 83 (61%) |
| Med School Location (#, %) | Zimbabwe | 41 (30%) |
| | Zambia | 27 (27%) |
| | South Africa | 34 (24%) |
| | China | 18 (13%) |
| | Cuba | 12 (8%) |
| | Ukraine | 2 (1%) |
| | Romania | 1 (1%) |
| | Malaysia | 1 (1%) |
| Year of Medical School Graduation | 2019 | 49 (36%) |
| | 2020 | 23 (17%) |
| | 2021 | 64 (47%) |
| Medical School Sponsorship | NMDS | 113 (84%) |
| | Self-sponsored | 16 (11%) |
| | Scholarship | 7 (5%) |
| Home District of Intern | Maseru | 69 (51%) |
| | Berea | 14 (10%) |
| | Mafeteng | 13 (10%) |
| | Leribe | 12 (9%) |
| | Mohale's Hoek | 8 (6%) |
| | Butha Buthe | 5 (4%) |
| | Mokhotlong | 6 (4%) |
| | Thaba-Tseka | 5 (4%) |
| | Quthing | 3 (2%) |
| | Qacha's Nek | 0 (0) |
| 1. Percent does not add to 100 due to rounding | | |

MONITORING AND EVALUATION OF THE INTERNSHIP PROGRAMME

Assessment of the Internship Program. We described the inputs and outputs of each internship activity, and short, medium and long-term outcomes expected from the programme in a Logic Model (Table 2). The Model helps to ensure that the programme monitors the right measures to determine if it is meeting its objectives. The overall indicators and metrics for success flow from this model and ensure that the programme is being evaluated systematically in achieving its obligation. LeBoHA developed multiple tools to assess success which include a "Data Dashboard" to monitor each of these factors and their impact on the major Indicators.

Assessment of Interns. Interns receive several assessments each year. Assessment are both formative and summative. First, successful completion of a rotation requires an intern to enter into the Workbook an adequate number of clinical procedures observed, assisted or performed. They must complete 75% of the number recommended for each procedure; and they must meet the recommended number of patients clinically evaluated.

Second, the supervisors assess interns in the competency areas of patient care, medical knowledge, clinical skills and professionalism during each rotation. The intern is rated on a scale of 1 – 5, with 1 representing an unacceptable for level of performance and 5 a superior performance. The intern must score 3 or more in each of the four core competencies to pass the rotation.

Lastly, the intern will be deemed to have completed the Programme upon successful completion of all nine rotations.

PROGRAMME ENROLLMENT, COMPLETION AND NUMBER REMAINING IN THE COUNTRY

Demographics of the Interns. Table 3 shows that the enrolled students had an average age of 31.0 years, with all being Basotho except for one, and 53 (39%) are male and 83 (61%) are female. The 136 students come from medical schools in 6 different countries. Forty-one (30%) studied in Zimbabwe, 27 (27%) in Zambia, 34 (24%) in South Africa, 18 (13%) in China, 12 (8%) in Cuba, and 2 (1%) in Ukraine.

Forty-nine (36%) graduated in 2019, 23(17%) in 2020 and 64 (47%) graduated in 2021. Most were sponsored by the National Manpower Development Secretariat (NMDS).

The home district of more than half of interns was Maseru (51%), followed by Berea (10%), Mafeteng (10%), and Leribe (9%) while only 3 (2%) were from Quthing and none were from Qacha's Nek.

Table 4 shows that recruiting home the medical students finishing medical school in different countries has resulted in 136 medical students being enrolled in the Programme in eight cohorts since April 2019. Overall, of the 49 interns in the first cohorts that finished the 24 months of training, 46 successfully completed the Programme.

| Table 4. Interns Enrolled April '19 – November '21 in the Lesotho National Internship Programme | | | | | | | | | | |
|--|------------------------|----------------|----------------|--|---------|------------|----------------|----------|---------|-------|
| | Cohort Enrollment Date | | | | | | | | | TOTAL |
| | April '19 | Aug '19 | Oct '19 | June '20 | Dec '20 | April 2021 | | June '21 | Nov '21 | |
| # Enrolled | 27 | 15 | 7 | 7 | 17 | 11 | 2 ⁴ | 33 | 17 | 136 |
| # Completed | 27 | 13 | 6 | The cohorts enrolling in June '20 through Nov '21 have not completed the program to date | | | | | | 46 |
| # Supplementing ⁷ | 0 | 1 | 0 | | | | | | | 1 |
| # Withdrawn | | 1 | 1 | | | | | | | 2 |
| # Hired by GOL ⁶ | 26 | 7 | 1 | | | | | | | 34 |
| # Hired by CHAL, LDF or NGO's ⁶ | 1 ¹ | 6 ² | 4 ³ | | | | | | | 11 |
| # Post-grad program ⁵ | 2 | 0 | 1 ⁵ | 3 | | | | | | |
| Footnotes | | | | | | | | | | |
| <ol style="list-style-type: none"> 1. From the April '19 cohort, 1 intern was hired by Lesotho Defense Force (LDF) 2. From the Aug '19 cohort, hired by CHAL-4 by NGO- 2 3. From the Oct '19 cohort, 1 intern was hired by CHAL, 3 by NGOs 4. 2 dental interns were part of the April '21 cohort 5. One intern entered an oncology specialty training in Zambia, 2 interns enrolled in the Lesotho Family Medicine Specialty Training Program (and continued to be employed by GOL) 6. GOL=Government of Lesotho; CHAL=Christian Health Alliance of Lesotho, NGOs=Non-Governmental Organizations 7. Supplementing means that an intern is still in training after their cohort was eligible to graduate | | | | | | | | | | |

Table 4 also shows that of the 46 who completed the programme, 45 stayed to work in Lesotho. For example, in the April '19 cohort, 26 stayed to work for the Government of Lesotho (GOL), and 1 was hired by Lesotho Defense Force (LDF). Of the 26 that stayed to work with the GOL, 2 joined the Family Medicine Specialist Program. In the Aug '19 cohort, of the 13 who completed the programme, 7 were hired by GOL, 4 by CHAL and 2 by local NGOs. In the October '19 cohort, those who successfully completed -- 1 was hired by the GOL, 3 by local NGOs, and 1 by CHAL. One graduate from the October '19 entered an oncology specialty training program in Zambia.

AN OPPORTUNITY FOR IMPROVEMENT

Low Morale: The Internship Program was strained by several factors including the reluctance of the young doctors to return home, the lack of confidence of both their parents and interns in the capacity of the system to train the new graduates and the burden of the large numbers of interns who returned home in one go.

These challenges were compounded by delayed administrative oversight which resulted in the intake of large numbers of medical interns before administrative readiness. All the guiding documents were brief, a situation which was taken advantage of in different ways.

Response by LeBoHA, LMPDC and MOH. In the last three years there have been great strides made and a positive change in all strata of learning, supervision and administration of medical and dental internship. LeBoHA, LMPDC and the MOH worked together to improve administrative processes, intern oversight and communication among the stakeholders and rotation sites.

The changes made to improve the internship below and in Table 5.

Strengthening Administrative Processes. To address these concerns, the internship team produced an *Internship Training Agreement* that tabled the rules and regulations of the internship. This was signed by the Internship Program and the individual interns.

The team also produced an explicit *LMDPC Medical Internship Program Guidelines* handbook describing the goals and objectives and evaluation metrics of interns and distributed it to training sites, supervisors and interns.

The workbooks were also designed and drawn to record the interns' gain of experience and clinical skill development to demonstrate their competency and their professionalism; and to complement the supervisors' overall assessment.

LeBoHA now keeps an *Internship Data Dashboard* to monitor the short, medium and long-term outcomes and indicators. Meetings are held to update stakeholders on a regular basis.

There were challenges with the workbooks in that the procedures requiring documentation did not always align with the procedures done on that rotation that was addressed.

LeBoHA now organizes travel by providing a driver to pick up interns at the end of each rotation and to transport them to the next rotation. Centralized teaching sessions are held regularly on topics appropriate for interns. Doctor's coats and nametags are now provided to interns.

Initially the plan was for interns to get accommodated in available housing at the clinical sites, but the lack of housing at each site necessitated a new plan. The intern is now responsible for obtaining and paying for his/her own housing with funds provided as part of their stipend.

Strengthening Intern Oversight. The internship team wrote the *Internship Code of Conduct* to clarify professional and educational expectation among interns. Also written were the *Representative Terms of Reference* and an *Internship Agreement* that is signed by the intern before beginning the programme. LeBoHA created a series of *Monitoring and Evaluation Tools* to allow the grading and evaluation process to be transparent and understood by interns. The revised *Rotation Workbooks* designed for each rotation provide data for these evaluations.

The internship coordinator conducts one-on-one supervisory meetings with interns at mid-point and at the end of each rotation to provide better

orientation, formative feedback and mentorship. This meeting includes a review of the number of patients evaluated and comprehensiveness of the clinical notes they have written, procedures done and attendance at ward rounds and teaching conferences. The coordinator then reviews the quality of workbooks with attention to the proper signing by the supervisors. Site visits performed are part of the quality metrics dashboard.

TABLE 5. Pedagogical and Administrative Activities Implemented to Improve Internship

| Strengthening Administrative Processes |
|--|
| 1. Internship Programme Guidelines Handbook |
| 2. Internship Training Agreement |
| 3. Organized travel between rotation sites at the end of rotations |
| 4. Housing at rotation sites arranged by providing stipend directly to intern to find their own housing rather than at government hospital housing |
| Strengthening Intern Oversight |
| 5. Internship Code of Conduct www.leboha.org.ls |
| 6. Internship Representative Terms of Reference |
| 7. Monitoring and Evaluation Tools and Processes |
| 8. Workbooks written for each rotation |
| 9. Midterm supervision visits to interns for one-on-one assessment and feedback meetings |
| Strengthening the Rotation Sites and Rotation Supervisor Skills |
| 1. Standards of accreditation of rotation sites by LMDPC |
| 2. How to Be a Clinical Teacher Training Workshop |
| 3. Clinical rotation sites expanded in District Hospitals and Health Centers |
| 4. Criteria for certification of interns comparable to those in countries affiliated with the Association of Medical Councils of Africa (AMCOA) |
| 5. Data Dashboard to Monitor the Short, Medium and Long Term Outcomes and Indicators |
| 6. One-on-one meetings with rotation supervisors |

Strengthening the Rotation Sites and Rotation

Supervisor Skills. The LMDPC drafted "*Standards of Accreditation of Rotation Sites*" that list the necessary capacity of rotation sites in the areas of supervision and teaching and clinical testing (e.g., laboratory and radiology) services. Clinical rotation sites expanded to include more training in the District Hospitals and Health Centers seen as a way

to expose interns to important skills and mentorship in the rural areas. LeBoHA also conducted a series of workshops designed for rotation supervisors on “*How to Be a Clinical Teacher Training.*” These workshops equipped supervisors with skills to do assessments of interns and give constructive feedback.

Finally, the internship team organized meetings at rotation sites semi-annually. These meetings aim to further orient the rotation site supervisors and to receive feedback on the performance enrolled of interns in the program.

There is still much to do. There is now work being done to (1) increase the number of consultant supervisors, (2) further equip the rotation sites with enough resources (e.g., laboratory, X-ray) to pass the accreditation and (3) come up with a certification mechanism for the internship graduates. Much of this work fits with the concurrent work to re-establish the medical school. Together, the medical school, internship program and development of post-graduate programs provide the medical education system needed for an improved health system.

CONCLUSION

The “Lesotho Medical Internship Programme” is now re-established and on a solid foundation for the future. The interns express a positive outlook towards programme, and many of the administrative processes are now set-up. Of the 136 interns that have matriculated, 87 are still in training, and of the 49 whose cohorts have finished 2-years, 46 (94%) successfully completed the program; 45 (98%) are now working in Lesotho and 34 (74%) are now working for the Government of Lesotho. Most of this has occurred despite the challenge of COVID-19.

It is remarkable to see that 88 Basotho doctors are now working in Lesotho, many in the rural districts and most are either graduates or still in training in the Internship Programme. There are some district such as Mokhotong where FM consultants are supervising FM trainees, internship graduates and interns in training. The professional development, teaching and research opportunities, collegiality and the critical mass needed to provide improved

clinical care and quality improvement programs – are factors that will help to retain these doctors in the country.

The Lesotho Medical Internship program provides great hope – and is a story in which the people of the Mountain Kingdom can be proud.

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When the MOH-sponsored LeBoHA-directed Internship Programme and the postgraduate Family Medicine Specialty Training Programme are combined, there are now more doctors trained in MOH sponsored doctor training programmes than there were doctors in the entire country in 2005.

Health System Strengthening Using Problem Solving for Better Health® in Lesotho

Grace H. Yoon MSc, PhD(c),^{1,2} Shannon N. Ogden MPH,² Elizabeth Limakatso Nkabane-Nkholongo RN, MPH PhD (c),^{3,4,5,6} Mantoetse Jobo,³ Chelsea M. McGuire MD, MSc,^{3,4,5} Sebaka Malope MD, MMedEd (PhD(c)),^{3,4,5,7} Pamela Hoyt-Hudson BSN, RN,⁸ Barry H. Smith MD, PhD,⁸ Brian W. Jack MD^{3,4,5}

1. Department of Global Health, National Taiwan University, Taipei, Taiwan
2. Department of Health, Law, Policy and Management, Boston University School of Public Health, Boston, Massachusetts
3. Lesotho-Boston Health Alliance, Florida 567, Maseru West 105, Kingdom of Lesotho
4. Lesotho Ministry of Health/Lesotho-Boston Health Alliance (LeBoHA) Family Medicine Specialty Training Program
5. Department of Family Medicine, Boston University School of Medicine Boston, Massachusetts, USA
6. Sefako Makgatho University, Department of Health System Management and Policy, Pretoria, Republic of South Africa
7. University of the Free State, College of Health Sciences, Bloemfontein, Republic of South Africa
8. Dreyfus Health Policy and Research Center, New York City, New York, USA

Corresponding Author: Grace Yoon ghyoon@bu.edu

ABSTRACT

Background. Problem Solving for Better Health® (PSBH) is a system-strengthening workshop designed to empower healthcare workers (HCWs) to solve problems. We report on the perspectives of HCWs trained in PSBH to better understand the impact and challenges of PSBH in Lesotho, a country among those with the highest prevalence of HIV and tuberculosis in the world.

Methods. HCWs who attended PSBH workshops in 2018 – 2019 were interviewed using a semi-structured interview guide developed from a hybrid conceptual framework that captured the HCWs' personal, interpersonal, and systemic levels of experience. Interviews were transcribed and analyzed using the framework matrix analysis method using NVivo.

Results. We interviewed 22 of the 86 HCWs who participated in PSBH workshops in 2018-2019. Twenty out of 22 interview participants reported that they initiated a project that was planned during the PSBH workshop. Participants reported that PSBH provided them with a new way of viewing, addressing, and solving everyday problems that can have a tangible impact on the function of healthcare facilities and the health of the

community. Trainees were motivated to see the impact of their work in their jobs and in the work of subordinates as a sustained ripple effect favoring quality improvement. Participants suggested that training of district administrative leaders in PSBH would facilitate successful dissemination and help overcome the challenge of adding more work for the already-overburdened HCWs.

Conclusions. HCWs in Lesotho report that PSBH assists them in solving problems in their everyday work. This led the national Ministry of Health Quality Assurance Unit to request that PSBH workshops be conducted to train Ministry personnel to allow them to oversee national dissemination of PSBH, thereby fulfilling a component of the National Quality Assurance Strategic Objectives.

Key words: international health, health system strengthening, workforce capacity, Lesotho, sub-Saharan Africa

INTRODUCTION

Health-system strengthening programs are of crucial importance, especially in low-resource nations such as Lesotho. The Lesotho healthcare system serves a population of approximately 2.14 million people, where the average per capita health expenditure is \$276 per year and average life expectancy is 53 years.¹ Predominantly rural and mountainous, Lesotho faces many health challenges, such as having among the highest HIV/AIDS and tuberculosis prevalence in the world.^{2,3} Identifying low-cost methods to strengthen all aspects of the health system is a priority.

Lesotho-Boston Health Alliance

Lesotho-Boston Health Alliance (LeBoHA) is a registered, non-profit organization in Lesotho that aims to strengthen healthcare management, policy, planning, and human resource capacity. LeBoHA has partnered with the Lesotho Ministry of Health (MOH) to train health care workers (HCWs) in a quality improvement and problem-solving methodology called Problem Solving for Better Health® (PSBH). PSBH was developed to harness “human potential and possibilities for change.”⁴ Through LeBoHA, Boston University faculty and Dreyfus Health Foundation staff partnered with the Lesotho MOH to train HCWs in the PSBH methodology with a focus on the HIV/AIDS epidemic since the early 2000s. Currently, all PSBH workshop facilitators are Basotho (the people of Lesotho), and workshops are largely delivered in Sesotho (the language of Lesotho).

LeBoHA also collaborated with the MOH to establish the nation’s first accredited postgraduate physician specialty training program, called the Family Medicine Specialty Training Program.⁵ These trainees work in most of the country’s 10 districts as clinician-administrators. Of these current healthcare leaders, eleven are trained in PSBH, most of which have gone on to co-facilitate a PSBH workshops in their districts.

Program Description

PSBH is based on the scientific method and targets HCWs at all levels. Its major focus is to promote broad, sustainable skill-building by encouraging participants to identify a problem that is within their scope of everyday work and within their

authority to address. PSBH has been taught worldwide for over 30 years, including 32 countries across Africa, Asia, Eastern Europe, the Middle East, and North America. To date, more than 70,000 healthcare professionals have participated in PSBH workshops and have completed some 50,000 quality-improvement projects. For Lesotho, PSBH is a low-cost means of catalyzing projects that address problems important to HCWs and the people they serve across the country.⁴

The workshop facilitates the attendees’ development of a practical plan to address the identified problem using little to no funds, at least at the start.⁶ In each 2.5-day PSBH workshop, HCWs are taught how to:

1. Define the problem (size, cause, and contributing factors)
2. Prioritize the problem (focus on one realistic piece of the problem)
3. Define a solution, asking a “good question” (doing what, with whom, where)
4. Create an action plan (why, what, how, means of evaluation)
5. Take action (project conducted over 6-12 months)
6. Follow-up (workshop facilitators monitor and provide advice over time)

After three to six months of the initial training, participants receive a one-day follow-up refresher training and report results according to a pre-determined evaluation criterion. PSBH facilitators monitor the progress of participant’s projects, providing advice and collating results and impact.

Despite the expansion of PSBH in Lesotho, there has not been a systematic evaluation of the program involving perspectives of participants. To contribute to the program’s continuous adaptation to best fit the needs of Basotho HCWs and draw on generalizable lessons for dissemination of PSBH in similar settings, we aim to explore the perspectives of participants in recent PSBH workshops conducted in 2018-19. The purpose of this qualitative evaluation is to identify the impact of PSBH on participants’ (a) perceived capacity to solve problems in their daily health-sector work and (b) beliefs about the potential of PSBH to be used as a

tool to advance Lesotho’s healthcare improvement strategy.

METHODS

We carried out a qualitative study interviewing workshop participants who attended PSBH workshops between 2018 – 2019.

Conceptual Framework

The semi-structured interview guide was designed to capture major components of the PSBH program in our evaluation, with themes spanning individual growth to systemic impact. Our PSBH evaluation framework was adapted as a hybrid from three previously published frameworks used in the fields of management and public health:

1. Six-step problem-solving model:⁷ Major areas of systemic impact that arises from implementation of a problem-solving technique (Outer cycle)
2. Empowerment framework:⁸ Individual growth represented by positional acknowledgement and situational awareness (Top of the inner ladder)
3. Problem-based/action-based integrative learning model:⁹ Intrinsic motivation leading to continued participation beyond the workshop; specific components for personal and interpersonal participation which both lead to skills-building to breakdown complex problems into small, feasible steps (Rest of the inner ladder).

A figure showing the conceptual model is available upon request.

Development of the Interview Guide

A semi-structured interview guide was developed based on the conceptual framework with feedback from experienced PSBH facilitators and LeBoHA leadership. Table 1 shows the interview guide was created to explore the three major categories described in the conceptual model and was used for all interviews.

Data Collection

Between June-September 2019, GHY conducted interviews with 2018-2019 PSBH workshop participants. Interview participants were recruited via convenience sampling from a list of participants

provided by LeBoHA. The interviews were conducted individually in-person or by phone. GHY transcribed 16 audio-recorded interviews semi-

Table 1. Semi-structured Interview Guide

| | |
|----|---|
| 1 | Can you briefly describe what the PSBH workshop was in your own words? |
| 2 | Do you see that the PSBH workshop affected your professional ability in your work setting? Why or why not? If not, what could have been done to do so? |
| 3 | Did you have any similar educational sessions prior or after the PSBH workshop, aside from your required professional education? If so, how does the PSBH program differ or not differ? |
| 4 | Describe your desire, interest, or commitment to the workshop now that you have completed the workshop. Do you want to be engaging in the skills that you acquired? Why or why not? |
| 5 | How has the implementation of these skills specifically helped you at work? |
| 6 | Has this been integrated into your workflow and if so, how? |
| 7 | What problems have you encountered trying to implement your skills at your day-to-day work? |
| 8 | To what extent has your work environment supported your participation in the PSBH workshop? |
| 9 | In thinking generally about this workshop – do the benefits outweigh the costs? How so? |
| 10 | How ready and confident are you to teach workshops on your own? |
| 11 | Are you confident to teach / organize, but lacking resources? What are you most lacking? |
| 12 | Other barriers for disseminating the workshop to your district hospital? |

verbatim and removed all identifying data. Semi-verbatim transcription, in the context of this study, means that extraneous sounds, remarks or repetitions were omitted in the transcription, and words were added, as appropriate, for clarity. The other six participants’ responses were recorded by manual notetaking. Field notes from these interviews were elaborated and contextualized by the interviewer, and typed into a separate, de-identified document. All de-identified documents were uploaded onto the coding software, NVivo

(QSR International Pty Ltd., version 11, 2017), for analysis.

Analysis

A preliminary codebook was developed to identify major informational categories, based on the domains outlined in the analytic framework. Additional overarching codes that were not part of the analytic framework, were incorporated to allow for inductive grouping of additional relevant data. These consisted of the codes describing barriers, facilitators, golden quotes for especially notable quotes, and a miscellaneous category for data not fitting into any of the codes developed above.

Using the framework matrix analysis method,¹⁰ two authors (GHY and SNO) coded all transcripts. Initially, four transcripts were double coded to reach consensus on the operationalization of the codes. Several sub-codes were identified inductively and added to the codebook throughout the double-coding process. Once both coders were comfortable with the coding mechanism (inter-rater reliability = 90.2%), the remainder of the transcripts were divided and single-coded. Coders held weekly meetings to discuss and reconcile any coding concerns. Results were discussed and validated with an experienced PSBH facilitator (SM) and the LeBoHA director (ELN). Participant locations and roles were obtained from the LeBoHA PSBH database. Titles of projects designed during the PSBH workshops were obtained from the LeBoHA PSBH database or elicited during interviews.

| Role | n (%) |
|----------------------------|-----------|
| District health manager | 5 (22.7%) |
| Physicians | 3 (13.6%) |
| Pharmacy staff | 3 (13.6%) |
| Laboratory staff | 3 (13.6%) |
| Nurses | 7 (31.8%) |
| PSBH facilitator | 1 (4.5%) |
| <i>District in Lesotho</i> | |
| Leribe | 9 (40.9%) |
| Mafeteng | 4 (18.2%) |
| Mokhotlong | 1 (4.5%) |
| Berea | 4 (18.2%) |
| Butha Buthe | 1 (4.5%) |
| Thaba Tseka | 3 (13.6%) |

Ethical Considerations

After informing the participants of the study purpose and associated risks (i.e., potential breach of confidentiality despite de-identification of interview transcriptions), the interviewer received verbal informed consent prior to the interview and beginning of note taking or audio recording. Because of the low-risk nature of the study, written consent was not required. For one participant who declined audio recording and for five interviews that could not be recorded due to lack of recording capability or background noise, the interviewer took notes on a secure laptop.

Ethics Approval and Consent to Participate. All study procedures were approved by the Boston University Medical Campus Institutional Review Board (IRB; Protocol number H-38913).

RESULTS

Table 2 shows the roles and job location of Interviewees. Out of the 86 participants trained in 2018-2019, 37 were reached and 22 consented and completed the interviews. Many of the interviewees were nurses in varying capacities, including public health nurses, nurse matrons, and nurses-in-charge. We combined the roles medical officers and medical superintendents under the category of physicians. District health managers are also licensed physicians, but they were categorized separately because their leadership roles spanned both clinical and management responsibilities within their districts. Seven of the 10 districts in Lesotho were represented. Twenty of the 22 interviewees (90.9%) had initiated a project designed at the PSBH workshop they attended.

Table 3 shows the PSBH projects designed by participants interviewed. Generally, projects included efforts to improve clinical documentation, reduce patient wait-times, and improve the supply of medications, among others.

Table 4 shows key themes identified in the interviews. The analysis resulted in the identification of four themes. Each key theme is discussed below with quotes from the participants included to exemplify each finding.

Participant Perspectives on the Impact of PSBH

Most participants described PSBH as an effective skills-building workshop that shifted the way in which they viewed everyday workplace problems. One participant illustrated this by describing what they took away from the workshop:

“Why is it a problem, what that problem is, and why is that problem your problem? So those are the best things that I took from the training, because if I know all those answers then it helps me to go to the root, the cause, of the problem. It also helps me to shape my outcome, the expected outcome and things that are going to lead me to that expected outcome.” (District Health Manager 1)

When asked about weighing the benefits and time needed to attend a PSBH workshop, participants generally agreed that its impact outweighed the costs and described the real-world, patient-level impact that PSBH projects have had on their healthcare facilities:

“You can see the improvement that has happened, that it wasn't just for the sake of having the workshop. Now [because of the impact of my project] the patients are returning happy, being seen by the doctor. [...] They were taking their whole day to come to see the doctor. But now if they can take a few hours, they will still go to do other things afterwards, or they will still go to back to work afterwards.” (Physician 1)

Another participant noted that designing a quality-improvement project using PSBH methodology was beneficial because it provides a data-oriented approach in daily work and has the potential to impact the health of the community while saving costs.

“If you use your data, you will see the hiccups. So, where we see that we are having the problems with the immunization, they can see how many projects we can do in order to improve that indicator for child survival [...] it's going to benefit the whole country. (District Health Manager 2)

Table 3. PSBH Projects Designed by Participants Interviewed

| | |
|-----|---|
| 1. | Helping the hospital attain and maintain hygienic toilets |
| 2. | Conducting supportive supervision in local health centers |
| 3. | Improving documentation and upgraded implementation of laboratory quality management systems and increasing performance |
| 4. | Raising the quality of nursing documentation |
| 5. | To decrease percentage of patients who are waiting for care at the end of day at the general outpatient department |
| 6. | Reducing the number of emergency cesarean sections referred to [hospital name] on weekends and public holidays |
| 7. | Addressing documentation gaps which lead to poor nursing care |
| 8. | Improving service delivery in the pharmacy |
| 9. | Increasing competency in resuscitation among casualty staff |
| 10. | Reducing the percentage of nurses who do not adhere to the use of “Integrated Management of Childhood Illness” guidelines |
| 11. | a) Improving the productivity of District Health Management Team monthly meetings b) Expanding primary care for local miners |
| 12. | Improving upper management’s performance with quality assurance scores |
| 13. | Ensuring adequate drug supply in the casualty department |
| 14. | Decreasing patient wait-times in the outpatient department |
| 15. | Address long-term stock-out of Pentrol 400 (a lab reagent) |
| 16. | Obtaining new and repairing broken lab instruments |
| 17. | Increasing percentage of “Category A Commodities” (pharmaceuticals) that are stocked according to standards |
| 18. | Reducing the percentage of non-compliant prescribing nurses when treating common illnesses |
| 19. | Increasing screening for renal complications |
| 20. | Improving management and quality of care for malnourished children |

Engagement and continued use of PSBH skills

Many trainees learned from carrying out their PSBH projects and practicing PSBH tenets in everyday work. Below are examples contextualizing this

statement using data organized in three subtopics according to the conceptual framework: (1) intrinsic motivation, (2) personal participation, and (3) interpersonal participation.

Intrinsic motivation: Participants shared examples of how PSBH helped them to improve the work they do each day, which then motivates them to continue practicing the problem-solving methods learned from PSBH.

“Should you be able to follow through and be able to follow up to the end, then I’m telling you we are going to celebrate every day. [...] I think it [PSBH] can help a lot in helping our service delivery.” (Nurse 1)

Interpersonal participation: Participants stressed the importance of having buy-in from local leaders in their healthcare facility and national health leaders in the MOH for the workshop to have true impact and reach:

“We have to convince the leaders. We need to identify the leaders, people who can actually push it, then we won't have many barriers. It just needs sustainability and ownership (Nurse 1)

Many of the attendees in leadership positions, such as this District Health Manager, commented on how encouraging it was to see the impact of PSBH not only in their work, but also in the work of their coworkers. This participant expressed gaining motivation to continue practicing PSBH from seeing the impact PSBH has on other HCWs:

“For me, I have a great desire [to continue] because I've seen a great impact of [PSBH]. Because even the way that even from our cleaner, from our head of units, from the nurses, from us, everybody, I've actually taught them [...] a tactic of saying, "What is the gap? [...] What is the cause of this?" So then we turn these 'causes' into to activities. Therefore, with that, we've seen that our planning is very effective, so my desire is to continue doing it because it actually is an effective way of planning.” (District Health Manager 3)

Personal participation: The applicability of the lessons learned from PSBH in their own personal

work and everyday activities that mattered to them in their jobs was mentioned by several interviewees. A participant noted that while she had learned problem-solving concepts at the workshop, gaining a fuller understanding of the PSBH method came by practicing the skills through project implementation.

Institutional Impact of PSBH

We found numerous examples of successful participant projects having tangible impact on the function of the hospital or healthcare facility in which they work. For example, this lab manager recounts their success at improving the District laboratory by employing steps learned at their PSBH workshop:

“Yes, it was about implementing QMS (quality management systems) [...] The quality starts from where the samples have been taken from the patients up until the results are given back to the patients. We have to monitor all those steps so that other people will see that we have quality results [...] We have a tool that we have to use to assess the statistics that was approved by the WHO. So PSBH helps us to achieve our goals to accreditation. Yes, that’s the tool that we used. We really saw the improvement from [using] the tool.” (Lab staff 1)

Another participant recalls an issue they faced with the hospital’s finance department in getting necessary blood pressure machines for the inpatient wards. They explain how the PSBH workshop helped them organize and communicate their problem logically, allowing them to resolve the issue at the local level:

“Before, I would just request, ‘Can I have 1, 2, 3..’ then they’ll just say ‘no, we don’t have.’ You know how finance offices work. When they say they don’t have money, they don’t have money. But after I explained, ‘we are having problems which leads to mismanagement of patients,’ it starts to make some sense now to the Finance Officer [...] I had to justify the end strategy. I got the blood pressure machines that I wanted.” (Nurse 3)

Facilitators and Barriers to Dissemination of PSBH

A major facilitator was proactive leadership, such as this participant who implemented informal downstream training of PSBH principles to local clinic nurses:

“They [PSBH lessons] help me a lot because when we are doing our supportive supervision and mentorship, we encourage nurses, if we have problems in their facilities, they can make a three-month to six-month quality improvement project on their own to help improve their indicators in the health centers.” (District Health Manager 4)

Participants who are leaders in their departments stated that their own practice of the PSBH methodology created a ripple effect of new quality improvement projects in their facility. This occurred via an informal process of step-down training and knowledge-sharing from the PSBH workshop participants to other HCWs in the same workplace.

“I did step-down training in the clinic. Now even the cleaners must do a project to improve quality of their work. At the time of their training, they were very motivated [...] My junior staff, they no longer ask me to solve problems for them. They now are committed to solving the problems on their own. They suggest steps to solve their own problems.” (Nurse 2)

When asked about any foreseeable barriers to the further dissemination of the PSBH workshops across their District and Lesotho, participants mentioned stressors such as the limited number of skilled HCWs. Specially, the same, small number of healthcare professionals often receive specialized workshops and trainings from both the MOH and other NGOs, to the point where they find less time to do their primary clinical and leadership duties. Also mentioned were the lack of resources (money, time, and staff) that make it difficult for existing HCWs to also take on the responsibility of training others to further disseminate the PSBH method:

“The challenge is that we are short-staffed [...] I think with these new nurses, I will do it. Because now I will know that I have certain number of nurses in the male ward, and permanently,

certain number of nurses in female ward, and other wards. So, when they get the training, on [how to provide better] patient care, I think it would be perfect.” (Nurse 5)

DISCUSSION

This evaluation of PSBH workshops provides evidence that the PSBH process in Lesotho positively influenced the ability of health workers to solve problems that are within the scope of their jobs. PSBH has also influenced national leaders in the MoH to incorporate this methodology into the national quality-assurance strategy, and into the in-service training of all nurses and postgraduate physicians – providing both national dissemination and sustainability.

PSBH Represents an Alternative Approach to Problem Solving

In Lesotho, as in other low-resource settings, there is often an over-reliance on centralized solutions to everyday problems.¹¹ These findings suggest that it is a viable strategy for Lesotho to provide an alternative to programs that offer “top-down” approaches to problem-solving. Numerous global health organizations have worked with local partners to build capacity-strengthening programs in health that use a variety of methodologies, such as continuous quality improvement. Reliance on centralized resources for local health system issues can lead to limited transparency, priority setting and use of evidence relevant to regional contexts.¹²

PSBH differs from a centralized approach in several important ways. It emphasizes a decentralized and egalitarian (equity-fostering) approach, where problem-solving is the responsibility of health workers at all levels. PSBH is a highly adaptable short curriculum and process of direct application that teaches individuals at all levels of the health system the skills needed to identify and solve problems they face and over which they have authority. Training in PSBH for District Medical Officers, health-center nurses, pharmacists, laboratory technicians and food and environmental services staff, among others, is a strong strategy to establish a quality-improvement culture in resource-limited settings. This frontline response promotes a cultural shift that changes the way problems are considered and addressed, releasing

the innate potential of workers to solve problems in their facilities. Participants feel encouraged to take further action when they see the impact of their own PSBH projects on the quality-improvement work of their subordinates, observing that they are intentionally (or unintentionally) spreading the PSBH methodology in their health facilities.

Post-Workshop Completion of PSBH Projects

Mastering problem-solving skills requires not only creating a plan for quality-improvement projects during the PSBH workshop, but also implementing and evaluating those solutions once back on the job. Consistent post-workshop coaching and mentoring to assist participants in seeing their projects to completion is an important component of PSBH. Training MoH Quality Assurance Unit, District Health Management Teams, and District Medical Officers in PSBH will help make this a practical reality.

In our evaluation, participants reported that successful completion of their projects was hindered by lacking peers and managers who knew and understood the PSBH methodology. They suggested that the rate of successful project completion could be improved by training MoH and District health leaders in PSBH, enabling them to provide advice and support. Training government staff in PSBH would also increase their appreciation of the process, resulting in an opportunity for the

health workers to discuss and refine their workshop-created problem-solving plans with them and help align the projects with MoH's strategic goals, while providing dedicated time and resources for project completion. Such support would give the participants' projects value and meaning, while providing an opportunity for MoH staff to become aware of problems and solutions at the grass-roots level.

Limitations

The limitations of this study were several. First, we were unable to represent three districts in our analysis: Qacha's Nek, Quthing and Mochale Hoek, limiting the ability to generalize our findings to Lesotho as a whole. Secondly, the data collection was dependent on a single interviewer's availability in each District and their success in contacting potential participants in scheduling of participant interviews over a short time of three months. In addition, there may have been courtesy bias in the participants' responses since the interviewer was a LeBoHA-affiliated, non-native interviewer not previously known to the interview participants. For qualitative analysis of the data, only one author actively collected data by interviewing the participants, so the second coder did not have the same insights that would have been helpful with respect to contextualizing the interviews that they coded.

Table 4. Key Themes Identified in Interviews of Health Care Workers (n=22)

| Perspectives on PSBH Training | |
|---|---|
| 1. | PSBH provides skills-building that helps participants address everyday workplace problems |
| 2. | PSBH has real-world impact on patients and health facilities |
| 3. | PSBH's data-oriented approach can impact the health of the community and be cost-saving |
| Engagement and continued use of PSBH skills | |
| 4. | Trainees learn from carrying out projects in everyday work |
| 5. | Trainees were motivated to see PSBH's impact on their services |
| 6. | The lessons learned from PSBH can be integrated into everyday activities that matter to participants |
| 7. | Local / national leader buy-in is critical for the workshop to have true impact and reach |
| 8. | PSBH can create a ripple effect on quality improvement projects in healthcare facilities |
| Institutional impact from PSBH practice | |
| 9. | Successful participant projects have a tangible impact on the function of healthcare facilities |
| Facilitators and Barriers to Dissemination of PSBH | |
| 10. | District leaders were proactive in implementing downstream training of local clinic nurses; intentionally or unintentionally sharing this methodology in their facilities |
| 11. | Every healthcare worker could benefit from learning PSBH methodology |
| 12. | Challenges include the capacity of HCW to add to their already overburdened jobs due to lack of money, time, and staff |

CONCLUSION

The partnership of LeBoHA, the Dreyfus Foundation and the MoH offers the promise of incorporating PSBH affordably and sustainably into Lesotho's national quality-assurance strategy. In addition, evaluating the impact of PSBH in a small country like Lesotho can serve as a guide for assessing the potential usefulness of implementing similar or different problem-solving methodologies in other countries or regions with parallel characteristics. Demonstrable, quantitative improvements in hospital function and patient outcomes because of national dissemination will provide the ultimate test of PSBH's value as a quality improvement tool.

DECLARATIONS

Authors' Contributions. GHY designed this evaluation study, conducted all interviews and the analysis, and wrote the manuscript. SNO assisted with the analysis, interpretation of results, and reviewed drafts of the manuscript. ELN conducted PSBH® workshops, arranged the interviews with participants and contributed to the background and discussion of this manuscript. MJ led all workshops that took place in 2018-2019. SM facilitated some PSBH workshops, organized interviews with participants, and reviewed the manuscript. BS and PH were involved in conceptualization of the project, funding of the program and its evaluation and contributed to the organization and content of the manuscript. BWJ conceptualized the project, obtained funding, and directed the project. CMM and BWJ were involved with data interpretation and organization of the manuscript. All authors approved the final manuscript.

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A Synopsis of Hypertensive Disorders of Pregnancy

Radiance Ogundipe MD, MMedFam ^{1,2}

1. Lesotho-Boston Health Alliance, Maseru, Lesotho
2. Lesotho Ministry of Health/Lesotho-Boston Health Alliance (LeBoHA) Family Medicine Specialty Training Program

Corresponding author: Radiance Ogundipe: rogundipe@leboha.org.ls

ABSTRACT

Hypertensive disorders are common complications of pregnancy, complicating 2 – 8% of pregnancies globally, and are responsible for about 9% of maternal deaths in Africa. My literature search did not yield specific prevalence data for hypertensive disorders of pregnancy in Lesotho however, anecdotal evidence suggests a high prevalence. Approximately two-thirds of the global maternal deaths occur in Sub-Saharan Africa. The 2014 Demographic and Health Survey estimated that 19% of the women and 13% of men aged between 15 – 49 years in Lesotho have hypertension and the maternal mortality in Lesotho was 1,024 per 100,000 live births. Many of these maternal deaths may be due to hypertensive disorders in pregnancy. Hypertensive disorders in pregnancy are associated with fetal and maternal complications and poor pregnancy outcomes such as preterm delivery, intrauterine fetal growth retardation, intrauterine fetal demise, placental abruption, and increased surgical deliveries. Women with hypertensive disorders of pregnancy are up to four times more likely to develop essential hypertension and cardiovascular disorders than women who are normotensive in their pregnancies.

INTRODUCTION

Hypertensive disorders of pregnancy are classified into five categories (Table 1).

Chronic hypertension in pregnancy refers to sustained blood pressure (BP) measurements of $\geq 140/90$ present prior to pregnancy or diagnosed before 20 weeks of gestation.

Gestational hypertension refers to sustained BP of systolic pressure of 140mmHg and/or a diastolic

pressure of 90mmHg and above developing for the first time after 20 weeks of gestation and becoming normal again postpartum. There is no proteinuria and no biochemical or hematological abnormalities.

Preeclampsia refers to sustained elevated BP measurements of $\geq 140/90$ mmHg developing after 20 weeks of gestation with associated proteinuria and/or features of acute kidney injury (Creatinine $> 90\mu\text{mol/L}$), hemolysis, thrombocytopenia, liver dysfunction, and fetal growth retardation.

Preeclampsia superimposed on chronic hypertension refers to features of preeclampsia developing in a pregnant patient with a diagnosis of chronic hypertension.

Eclampsia is a neurological manifestation of seizure episode(s) complicating preeclampsia. It is a hypertensive emergency in pregnancy.

Hypertension, elevated liver enzyme, and low platelet (HELLP) syndrome is a severe complication of preeclampsia in which all of these three features are present. It is not considered a disorder separate from preeclampsia.

PATHOPHYSIOLOGY

The pathogenesis of preeclampsia is not fully understood, but it has been linked with endothelial dysfunction, maternal immune intolerance, genetic, nutritional and environmental factors and chronic inflammatory response.¹⁴

CLINICAL FEATURES

Most patients are asymptomatic and are diagnosed during routine BP measurement as part of antenatal care. Standard procedures of BP measurement should be followed to ensure that the BP

measurements are valid and reliable, including repeating the blood pressure to ensure true hypertension.

| Table 1. Classification of Hypertensive Disorders of Pregnancy | |
|---|---|
| Chronic hypertension in pregnancy | Sustained BP $\geq 140/90$ prior to pregnancy or detected before 20 weeks gestation |
| Gestational hypertension | Sustained BP $\geq 140/90$ detected after 20 weeks gestation with no other features of preeclampsia and normalization of the BP postpartum |
| Preeclampsia | Sustained BP $\geq 140/90$ after 20 weeks gestation associated with proteinuria and/or features of acute kidney injury (Creatinine $> 90\mu\text{mol/L}$), hemolysis, thrombocytopenia, liver dysfunction and fetal growth retardation |
| Preeclampsia superimposed on chronic hypertension | Features of preeclampsia developing in a patient with chronic hypertension |
| Eclampsia | Seizures developing as a complication of preeclampsia |

Hypertension diagnosed for the first time at 20 weeks of gestation without proteinuria, biochemical or hematological abnormalities is referred to as gestational hypertension. It is usually benign and not associated with fetal growth restrictions or poor pregnancy outcomes. However, about 25% of women with gestational hypertension, especially those diagnosed before 34 weeks of gestation, go on to develop preeclampsia and have a more severe disease with poorer fetal outcome.⁵ It is thus important to closely monitor women with gestational hypertension.

Newly diagnosed hypertension at 20 weeks of gestation with accompanying proteinuria and/or features of acute kidney disease, liver dysfunction, hemolysis, thrombocytopenia, neurological abnormalities, or fetal growth retardation is regarded as preeclampsia.⁵ Proteinuria is not mandatory for a diagnosis of preeclampsia.⁵

The clinical course of preeclampsia can be unpredictable and may deteriorate rapidly without warning. Women with preeclampsia should therefore be very closely monitored, preferably as an in-patient in a facility that has the capacity for

feto-maternal monitoring and emergency surgical delivery. Neurological abnormalities that can feature in preeclampsia include severe persistent headaches and scotomata, and these may herald imminent eclampsia.^{5,14,15}

MANAGEMENT

Close feto-maternal monitoring is vital in the management of hypertension in pregnancy irrespective of the classification.

Maternal monitoring includes regular blood pressure measurements, screening for proteinuria, renal and liver function tests, full blood counts, and uric acid assay. Elevated uric acid is associated with a poorer prognosis in preeclampsia.⁵

Fetal monitoring includes serial sonographic growth evaluation, fetal umbilical Doppler assessment, and non-stress ultrasonographic assessment of fetal wellbeing.^{5,14}

As in all hypertension, even in non-pregnant persons, lifestyle modification is important in the management. Pregnant women should exercise regularly, avoid smoking and alcohol, and eat a healthy diet to maintain an ideal body mass index, to prevent obesity and other promoters of hypertension.^{5,16}

The BP should be managed to achieve systolic pressures between 110 to 140mmHg and a diastolic pressure of 85mmHg. Anti-hypertensive therapy should be reduced or withheld if the diastolic BP is below 80 mm Hg⁵

Persistently severely elevated BP of $\geq 160\text{mmHg}$ systolic or $\geq 105\text{mmHg}$ diastolic requires aggressive management to avoid fetal and maternal complications. The BP should be lowered by 15 – 25% aiming for systolic pressures of 140 – 150mmHg and diastolic of 90 – 100mmHg. Excessive lowering of the BP should be avoided as this can worsen placental ischemia and result in poorer fetal outcome.¹⁴

Drugs recommended for BP lowering with severe persistent BP elevation in pregnancy include Labetalol (a β blocker), Hydralazine (a vasodilator), and oral immediate-release Nifedipine (a calcium channel blocker). Prophylaxis against seizures is indicated in severe persistent BP elevation. Magnesium sulphate, with the additional benefit of

lowering BP, is the drug of choice for seizure prophylaxis and seizure control in eclampsia.^{14,15}

Delivery of women with preeclampsia should be at 37 weeks of gestation unless pre-term delivery is indicated by any of the following developments:⁵

- Repeated episodes of severe hypertension despite management with 3 classes of antihypertensive medications
- Progressive thrombocytopenia
- Progressively worsening renal or liver function
- Pulmonary edema
- Neurological abnormalities such as severe persistent headache, persistent scotomata or seizures
- Non-reassuring fetal ultrasonic evaluation

PROPHYLAXIS FOR PREECLAMPSIA

Women with strong risk of developing preeclampsia should be commenced on low dose aspirin (75 – 162mg/d) from 16 weeks of gestation and supplemental calcium (1.2 – 2.5 mg/d).^{5,11,17}

| Table 2: Risk factors for Developing Preeclampsia |
|--|
| Body mass index > 30 |
| Multiple gestation |
| Preeclampsia in earlier pregnancy |
| Chronic hypertension |
| Antiphospholipid antibody syndrome |
| Systemic lupus erythromatosis |
| Diabetes Mellitus prior to pregnancy |
| Maternal age >30 years |
| Assisted reproductive technology conception |
| Weakly associated risk factors include: |
| Advanced maternal age (>35 years) |
| Family history of preeclampsia |
| Relationship with father <6 months |
| > 5 years interval between pregnancies |
| First pregnancy |
| Chronic kidney disease |

CONCLUSION

Hypertensive disorders of pregnancy are responsible for considerable maternal morbidity and mortality, with associated poor pregnancy outcomes. Though the precise burden of the conditions is not documented in Lesotho, empirical evidence suggests that the burden may be high. It is

imperative that health practitioners are cognizant of the risk factors and are able to accurately diagnose, and manage the conditions. Public health education on the risk factors for developing preeclampsia and the nature of the condition should be intensified at the community level. Continuing education of health practitioners, displayed patient care algorithms, maintenance of emergency trolleys and practice drills on emergency management of severe preeclampsia or eclampsia may help to reduce morbidity and mortality from this condition.

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Factors Contributing to Pregnancy Induced Hypertension at Quthing Government Hospital in the Mountain Kingdom

Amelia Mashea MPH, BCur Education and Management ¹ and Mpolokeng Maliehe, BSC Nursing and Midwifery ¹

1. Department of Nursing, National University of Lesotho, Roma, Kingdom of Lesotho

Corresponding Author: Amelia Mashea; Email: masheam70@gmail.com

ABSTRACT

Introduction. Pregnancy Induced hypertension (PIH) is a common medical problem responsible for a high percentage of maternal morbidity and mortality. Evidence shows that the global prevalence of hypertension is 22% and the hypertensive disorders of pregnancy affect 10% of world population. An estimated 14% of maternal deaths are caused by hypertensive related disorders in Sub-Saharan Africa. PIH is the second leading cause of maternal deaths in Lesotho and despite health awareness campaigns about contributing factors of PIH which have been taking place in the country, prevalence of PIH remains high in Lesotho.

Objective. : The objective of this research was to assess factors associated with PIH in women diagnosed with PIH at Quthing Hospital, Lesotho.

Method. A facility retrospective descriptive, cross sectional study of medical records was conducted at Quthing Hospital Maternity Department whereby all records of patients admitted with PIH in 2012-2018 were reviewed. Microsoft Excel was used to capture and analyze data.

Results: Out of 100 records of women who delivered at Quthing hospital and were diagnosed with pregnancy induced hypertension (PIH), 80 records were randomly selected. Among these women, 54 (67.5%) were unemployed, 40 (50%) were from the rural areas of Quthing catchment area, 45 (56.25%) had body weight ranging between 70-79.9 kg with BMI ranging between 25-35 kg/m². Thirty-two (40%) of these women were pregnant for first time and 43 (53.75%) were between the

gestational ages of 36-40 weeks when diagnosed. Forty-two (52.5%) had a history of HTN in their families and 40 (50%) had some secondary education.

Conclusion. This study describes demographic and clinical factors associated with women diagnosed with PIH at Quthing Hospital. PIH and its complications remains a direct cause of maternal mortality in the country. Early ANC booking and proper screening for PIH could lead to early diagnosis and treatment of PIH and improved maternity outcomes.

Keywords. Pregnancy Induced Hypertension, Pregnancy complications, maternal mortality.

INTRODUCTION

Pregnancy Induced Hypertension (PIH) in women of childbearing age is a medical problem that contributes to maternal and perinatal morbidity around the world but at higher rates in developing countries.¹⁻⁷ PIH is characterized by new-onset of elevations of blood pressure after 20 weeks of gestation, or often near term, in the absence of accompanying proteinuria.⁸ Elevated blood pressure is defined as either a systolic blood pressure of 140 mm Hg or greater, a diastolic blood pressure of 90 mmHg or greater, or both obtained from the average of at least two measurements using the same arm.^{8,9}

Primigravida are affected mostly by this problem.¹⁰ PIH is significantly higher in pregnant women with post-secondary education, unemployed and in women whose pregnancy is complicated by the attempt of abortion compared with just being a primigravida.¹¹ PIH is associated with several complications such as

blood clotting problems, seizures in mothers, liver problems, kidney failure and *abruptio placenta*.¹²

Hypertensive disorders are considered to be among the major causes of maternal mortality, particularly in low and middle income countries.¹³ These disorders are the third leading cause of maternal deaths in Africa constituting about 9% of maternal deaths and are the leading cause of death in Latin America and the Caribbean countries.¹² In Lesotho, PIH is responsible for about 23.9% of facility based maternal mortalities.^{6, 14}

The purpose of this study is to determine factors contributing to PIH in women diagnosed with PIH at Quthing Hospital in Lesotho.

METHODS

Study Design. A descriptive retrospective survey was conducted. Records of all pregnant women aged 15-49 who were diagnosed with PIH and were attending antenatal care services at Quthing Government Hospital from 2012 through 2018 were reviewed.

Sampling and Sample Size. Quthing Government Hospital was selected as it is a rural hospital that receives patients with PIH referred from primary healthcare facilities in its catchment area. Obstetric records of women diagnosed with PIH between ages 15-49 who were attending antenatal care services were identified and a smaller sample was selected, using simple random sampling method.¹⁶

Data Collection. Records of pregnant women with PIH were identified. Eighty records were selected and reviewed. A pre-designed check list was used to collect data from the client's records. Data was collected by the investigators.

Demographic variables obtained were age (years), level of education (pre-school, primary, secondary, high school, tertiary), marital status (married, single, divorced, separated, widowed), employment (self-employed, employed, unemployed), and area of residence (rural, urban, foothills, valley).

Clinical variables of the clients were obtained and included weight (kg), height (cm), Body Mass Index (BMI), gravity, parity and miscarriages (number), gestational age at diagnosis (weeks), co-morbid diagnoses, and family history of PIH.

Data management and Analysis. Data cleaning was done to eliminate records which did not meet the selection criterion like those with incomplete information. It was then managed and analyzed using Microsoft excel. Microsoft excel was also used to summarize the findings in charts.

Ethical Clearance. Ethical clearance and approval to conduct the study was obtained from the National University Research Review Board and the Ministry of Health Ethics Committee as well as the management of Quthing Government Hospital. To ensure privacy and confidentiality, the data were captured in private room and files were returned to the data clerk immediately after use. No name or other personal identifiable data were recorded on the data collection form. Study identification codes were used to safeguard personal information.

RESULTS

Table 1 shows the demographic variables of women with PIH whose charts were reviewed.

Fifty-eight (75%) women with PIH whose records were reviewed were between the ages 21-30. Only 12 (15%) were aged 15-20 years and only 10 (12%) were over 30 years.

Regarding education, 64 women (80%) had some secondary school or higher education, and 16 (20%) had only some primary school education.

A slight majority (42 women, 52%, 42 who had PIH were married; while 28 (35%) of the women were single, 7 (12.5 %) were separated and only a few were widowed or divorced.

Regarding employment status of the clients with PIH 54 (67%) were not employed, and 26 (32%) were employed or self-employed.

Half of women whose charts were reviewed lived in a rural area, while 18 (22%) were living in urban area, 16 (20%) lived in the foothills and 6 (7%) lived along Senqu Valley.

| Table 1: Demographic Characteristics of Women with PIH at Quthing Government Hospital 2012-18 (n=80) | | |
|---|---------------|---------|
| | | # (%) |
| Age | 15-20 | 12 (15) |
| | 21-25 | 30 (38) |
| | 26-30 | 28 (35) |
| | 31-35 | 4 (5) |
| | 36-40 | 5 (6) |
| | 41-45 | 1 (1) |
| Education | Pre-school | 0 (0) |
| | Primary | 16 (20) |
| | Secondary | 40 (50) |
| | High School | 20 (25) |
| | Tertiary | 4 (5) |
| Marital Status | Married | 42 () |
| | Single | 28 () |
| | Divorced | 1 () |
| | Separated | 7 () |
| | Widow | 2 () |
| Employment | Self-employed | 10 (12) |
| | Employed | 16 (20) |
| | Unemployed | 54 (67) |
| Residence | Urban | 18 (22) |
| | Rural | 40 (50) |
| | Foothills | 16 (20) |
| | Senqu Valley | 6 (7) |
| Percentages might not add to 100% due to rounding | | |

Table 2 shows the clinical variables of women with PIH whose charts were reviewed.

Thirty-two (40%) of clients affected by PIH weighed between 70-79 kg; and 20 (25%) were 60-69 kg. Sixteen women (20%) were under 59 kg and 12 women (15%) were 80 kg or more.

Of the charts reviewed, 48 (60%) were between 1.4 and 1.59 meters. Only 9 (11%) clients were greater than 1.8 metres.

Forty-five clients (45%) had a BMI between 25 and 34 kg/m² and 29 (29%) had BMI between 35 and 44 kg/ m². There were only 3 (3%) with

BMI of less than 25 kg/m² and with BMI greater than 45 kg/m².

Thirty-two (40%) of the clients were pregnant for the first time, 25 (31%) were pregnant for the second time. Twenty clients (24%) were expecting the third and fourth child. Only 3 of the clients were pregnant for more than the fourth time.

Among the clients whose records were assessed, 42 (52%) were Para 0 and 16 (20%) were Para 1, while 11 (14%) were Para 2 and 9 (11%) were Para 3 and 2 (3%) were Para 4.

Only 1 (<1%) women reported a prior miscarriage.

Regarding the gestational age at diagnosis, 43 women (54%) were diagnosed with PIH at 36-40 weeks gestation, while 17 (21%) were diagnosed at gestational age of 31- 35 weeks, and 13 (16%) at 26-30 weeks.

Sixty-four (80%) who had PIH had no other reported medical conditions before the pregnancy. Only eight (10%) clients had history of chronic hypertension, 4 (5%) had history of diabetes, and four (5%) had history of twin pregnancy.

Forty-two (52%) of clients who were diagnosed with PIH had a relative(s) with history of hypertension in their family and 25 (31%) reported family members with Diabetes Mellitus. Family history of cardiovascular conditions was reported by 2 (3%) of the cases, and 11 (14%) reported a family history of twin pregnancy by a close family member.

DISCUSSION

Evidence shows that PIH is the second direct cause of maternal mortality in Lesotho.⁶ Our review of records of women diagnosed with PIH at Quthing Hospital in the years 2012-2018 identified the demographic and clinical variables associated with this condition in Lesotho.

This study revealed that young women between ages of 21-25 are mostly affected by PIH at Quthing Hospital. This is in contrast with what

| Table 2. Clinical Characteristics of Women with PIH at Quthing Government Hospital 2012-18 (n=80) | | |
|--|----------------|---------|
| Weight | 50-59 kg | 16 (20) |
| | 60-69 | 20 (25) |
| | 70-79 | 32 (40) |
| | 80-89 | 5 (6) |
| | 90-99 | 4 (5) |
| | 100-109 | 3 (4) |
| Height | 140-159 cm | 48 (60) |
| | 160-180 | 23 (29) |
| | 180-190 | 9 (11) |
| BMI | <25 | 3 (4) |
| | 25-34 | 45 (56) |
| | 35-44 | 29 (36) |
| | 45-55 | 3 (4) |
| Gravity | 1 | 32 (40) |
| | 2 | 25 (31) |
| | 3 | 10 (12) |
| | 4 | 10 (12) |
| | 4+ | 3 (4) |
| Parity | 0 | 42 (52) |
| | 1 | 16 (20) |
| | 2 | 11 (11) |
| | 3 | 9 (9) |
| | 4+ | 2 (2) |
| Miscarriages | 0 | 79 (99) |
| | 1 | 1 (1) |
| | 2 | 0 (0) |
| | 3+ | 0 (0) |
| Gestational Age at Diagnosis | 21-25 weeks | 2 (2) |
| | 26-30 | 13 (16) |
| | 31-35 | 17 (21) |
| | 36-40 | 43 (54) |
| | 40+ | 5 (6) |
| Co-morbid Dx | Diabetes | 4 (5) |
| | Chronic HTN | 8 (10) |
| | Cardiovascular | 0 (0) |
| | Renal | 0 (0) |
| | Twins | 4 (5) |
| | None | 64 (80) |
| Family History | Diabetes | 25 (31) |
| | HTN | 42 (52) |
| | Cardiovascular | 2 (1) |
| | Renal | 0 (0) |
| | Twins | 11 (14) |
| 1. Percentages might not add to 100% due to rounding | | |
| 2. HTN = hypertension | | |
| 3. Dx = Diagnosis | | |

other studies have identified in other places whereby risk of hypertensive disorders in pregnancy increases gradually with age over 35 years.¹⁷

We identified that more than half of women who had PIH also had BMI of 25-30 kg/m². It is a well-known that BMI of 25-29.9 is classified as overweight in pregnancy.² This is consistent with other reports that that gestational excessive weight gain puts women at risk of developing hypertension.^{18, 19} It is evident that nutritional status of a pregnant woman should be well managed in order to lower the risk of hypertensive disorders. Obesity is a growing health concern that has a negative impact on pregnancy and it has a direct link with hypertension.^{18, 19}

Another important factor that was revealed by the study was that 80% of all the cases had reached secondary education. It is possible that those with higher education have more stressful jobs that can impact blood pressure. This finding deserves further research.²¹

In this study, 67% of women with PIH were unemployed. This shows a possible link between poverty and hypertension.²⁴ Low maternal socioeconomic status is associated with hypertensive complications.²² Lesotho's economy is low with GDP of 10.2% which is said to result in food shortages.²³ Food shortage may be linked to poor nutrition which is further associated with risk of developing conditions like hypertension.²⁴

The study further revealed that more than half of the women who were affected by hypertension were married (52%). This brings an intriguing question of what could be an association between hypertension and marriage. We hope to continue to collect data on PIH so that our sample would be large enough to explore this potential relationship.

Many records of women who were assessed and have developed hypertension were Para 1 which is different from how things are happening in some parts of the world where the majority of cases of PIH are found in women

who are pregnant for the first time.²⁵

Half of the women in this study were from rural areas while others were from the foothills and urban areas. This shows a balance between women in rural and those from the urban areas as far as developing hypertension is concerned.²⁶ There are reports in other places where women from the rural areas were usually mostly affected than those in the urban areas.³

It is worth noting that majority of the affected cases assessed had no history of miscarriage before. Studies conducted in other parts of the world yielded similar results.³

The gestational age at which these women were when they were diagnosed with PIH was between 36-40 weeks of gestation. On the contrary, in one study PIH-associated complications was more frequent in early-onset (<32 gestational weeks).²⁶ It may be that the diagnosis of PIH in Lesotho is less often made at early gestational age.

Finally, most cases most women had a close family member who had hypertension. Similar reports were found in other studies.¹ A family history of hypertension is a risk factor that indicates that women should be monitored carefully for PIH.

LIMITATIONS

A limitation of this study was that it was done on a very small scale and its findings may not be generalized because of small sample size. Some records of clients were not completed and there were lots of gaps. This hindered the investigators to gather complete information. Even though the researcher intended to assess files from 2012- 2018, some files from 2012- 2014 were missing when the files were checked against recorded cases in the birth registers and this was due to poor storage of patients files at the facility.

CONCLUSION

Recommendations. PIH is a threat to the people in Lesotho especially now that it is the second most common cause of maternal

mortality in Lesotho. This study suggests that some preventive measures in the areas of diet and nutrition could be effective in decreasing the incidence. Unavoidable factors like low socio economic factor leading to poor nutrition require commitment from high levels of government to assist in alleviating poverty and making health and welfare of pregnant mothers a priority.

Women should be encouraged to attend antenatal care as early as possible during pregnancy for screening and early detection and for prompt management of the condition.

It is recommended that early detection and proper screening of antenatal mothers as well as urgent management of clients be maximized to reduce complications for both the mother and the foetus. Notwithstanding the fact that some factors may not be avoidable, it is worth realising that in many cases the condition can be managed with appropriate treatment including delivery of the baby.

The public should be educated about the contributing factors to PIH so that they avoid factors which contribute to the problem. Emphasis on family planning education and life style modification campaigns should be implemented.

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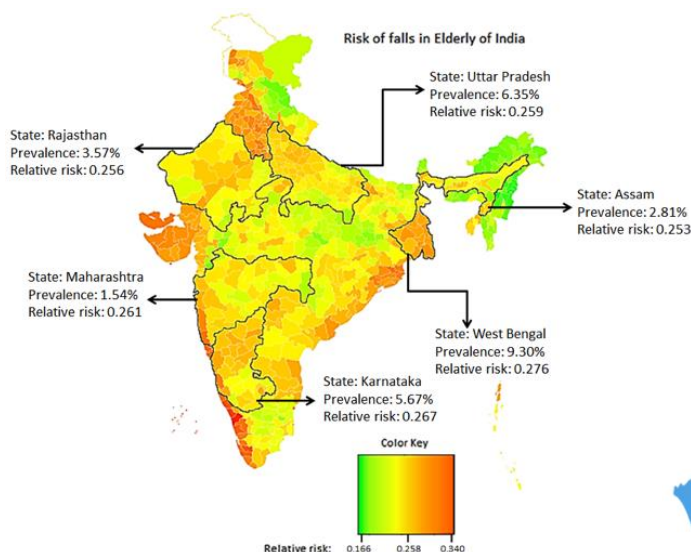
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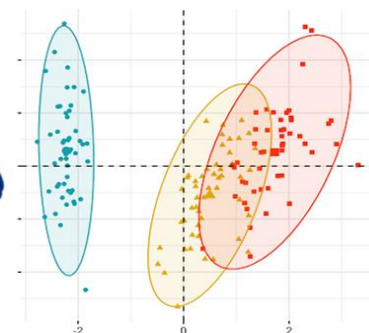
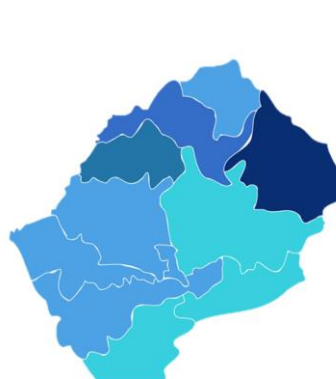
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- Dr. Abhinav Sharma, MD (Boston University)
Family Medicine Residency from University of Toronto.
Previous visiting medical student at Motebang Hospital, Leribe.
- Dr. Ashish Sharma, PhD –
Instructor at Emory University, specialist in HIV/AIDS research
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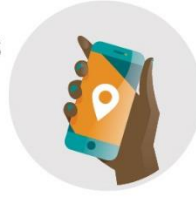
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