

# Lesotho Medical Association Journal



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Volume 12 No. 1 January 2014

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## Fore-warned is Fore-armed

*Dr. M. Mokete*

When UN, through WHO, pronounced itself on health prospects by the New Millennium namely “Health for all by year 2000” everybody thought the torch bearers were talking about “mission impossible” in, the then, twenty years.

At the time, following Alma Ata, the core principles of Primary Health Care had been laid down clearly and the mission for the different countries in the world was clear and possible especially because the main stakeholders had expressed political will.

The accessibility, affordability and education as well as all the multi-sectorial and cross- sectorial interventions of the different Government Ministries for the common goal were lost for almost a quarter of a century. The fore warning did not arm the world.

A repeat of the fore warning with a slight shift of goal posts was launched with the ushering of the New Millennium for fifteen years with the hope that with hindsight of the previous two decades, the same basic principles of Primary Health Care would be put on top gear hence the other side of the coin which is the Millennium Development Goals.

In the previous editorials of our journal reference was made to Goals one to six and today we would like to stress, albeit, belated the emphasis on ensuring sustainability of the environment.

If our principals (all executives) had as early as 1987 accepted and embraced the Brundtland report to United Nations which propounded this definition, “sustainable development is development that meets the need of the present without compromising the ability of the future generations to meet their own needs” we would be in a safer world today.

How many countries in the world have paid attention to the above definition in the domains of economics, ecology, culture and politics? My bet is very few if any! All have put their selfish interests first regardless of sustainability. Today, because of the neglect of the tenet referred to above, we have environmental health problems.

Climatic changes are of grave concern because results of the depleted ozone layer increase major vector borne diseases; ultra violet radiation increases skin, and eye cancer formation; macular degeneration, cataracts etc are also on the increase; ultraviolet radiation depresses the function of the immune system. Water depletion resulting from climatic changes in some areas also causes population migration. The above are only a few of the illustrative examples of the long catalogue of consequences of our irresponsibility vis-a-vis our health, and sustainable environment.

Once again this is a clarion call that being forewarned should be forearmed. Let us respond to the belated wakeup call as there is some light at the end of the tunnel, if action is taken and sustained.

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## From the President's Pen

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I would like to take this opportunity to thank Members of the Lesotho medical Association (LMA) for electing me to the office of president during their Annual General Meeting of 2013. I wish to assure them that I will execute all my duties with all the commitments, dedication and diligence expected and this will be possible if we all join our efforts to realize our mandate as members of the LMA. It is important also to indicate that this is the year during which the LMA will be celebrating its 40<sup>th</sup> anniversary. It marks a very important period which demonstrates to us that the LMA is surely gaining momentum as a professional body.

At this point in time, it is wise to take a step back to relate the age of the LMA with its developments with regard to its mandate. This will also add value in plans of this significant year of my tenure in the office of president and of course for the future, especially of this journal. The other aspect of reflections is to see how health trends have evolved and how we have moved to this moment in time. I wish to start from the Alma-Ata declaration of 1978.

Allow me to share with you that before Alma-Ata declaration, an outlook towards health was that of affluence, building of big, expensive and high technology health facilities. The hospitals were seen only as having sophisticated equipment and staff existing far away from ordinary people. An example of this was that of some "educated" Basotho officials who wanted translators to show how educated they were. It was found that this situation was unacceptable.

Consequently, in 1978, in a conference held in Alma-Ata, a town in the then Soviet Union, countries of the world came together to redefine the approach to health care and this culminated into the concept of Primary Health Care (PHC). Health care was then redefined as person and not disease centered. Health care was to be practical, accessible, affordable and with technology scientifically acceptable. However, there was still space for secondary care where patients with complicated and difficult conditions such as heart surgery and organ transplants were managed. The motto for PHC was "Health for all by the year 2000"

It is with pride that I allude to the fact that some of the countries, especially the third world or emerging economy countries embraced PHC concept very well and Lesotho was amongst those countries. The Health Centers were functioning very well and managed by appropriately educated Nurses including the Nurse Clinicians. Doctors were being trained and even though doctor patient ratio was not yet adequate, it was promising. During this period, there were significant number of summits held to assess progress towards "Health for all by the year 2000" and amongst them I can cite Ouagadougou. These assessments showed that Alma-Ata requisites would not be achieved.

At another meeting called the Millennium submits of 2000, 193 United Nation Members and some International Organizations promulgated eight (8) International Development Goals which were later popularly known as Millennium Development Goals (MDGs). Some of those goals were related to health while others would have a great impact on health. For your reminder, the MDGs are:

1. Eradication of extreme poverty and hunger;
2. Achieving universal primary education;
3. Promoting gender equality and improving women;
4. Reducing child mortality rates;
5. Improving maternal health and achieving universal access to reproductive health;
6. Combating HIV & AIDS, malaria and other diseases;
7. Ensuring environmental sustainability and;

### 8. Developing a global partnership for development.

All these goals are very important and have specific targets to be reached at 2015. How far are we with MDGs targets in Lesotho? It was since realized that there were some gaps in the MDGs hence an improvement to MDG 5a & 5b in 2007. The aim was to reduce maternal mortality by ¾ from 1990 – 2015, to address contraceptive prevalence and adolescent fertility to mention a few. While some countries have reduced maternal mortality, the performance in Lesotho is not satisfactory as evidenced by the ratio of 1155 per 100, 000 live births (DHS 2009). What is it that Lesotho is not doing right, where did we go wrong, how can we resolve the calamity. Can we afford to witness women dying as a result of this natural developmental process of child birth?

There are other compounding factors to maternal deaths such as sexual abuse to women in Lesotho. There is hardly any News bulletin in Lesotho without a mention of sexual offenses committed to women and children. These offences impact negatively on the overall development of the nation, "One death of a woman translates into three children dying from lack of care"

Presently, the Health Sector is being guided by the three policy pillars of "Universal access to health, Equity and Social justice". One wonders once again as to what plans are in place for these important and relevant pillars, what resources are available to realise them, where are Lesotho Human resources, what are we doing to address all of these questions and finally how can LMA contribute to address all the aforementioned?

In 2014, we will concentrate our efforts in reviewing what we (Medical Professionals) have done in the past 40 years; how has that impacted in the health delivery in Lesotho; what are we currently doing and; how can we improve on our work. In the past few years, we have witnessed LMA building networks with International and Regional Medical Associations, LMA has very close collaboration with South African Medical Association (SAMA). There is established membership of the World and African Association of Family Medicine Practitioners.

LMA has supported Medical Students to strengthen their Medical Students Association and adopted them as Associate Members of LMA. It has had a collaborative visit to Medical Students in their places of study in the Republic of South Africa as a strategy to encourage and motivate them to have patriotism and come back to Lesotho after completion, a situation which was very difficult before. These efforts were made possible through partnership with National Manpower Development Secretariat of the Ministry of Development Planning and the Human Resources Directorate of the Ministry of Health. For these visits, I wish to acknowledge the financial support from the European Union through SPARRC Project of the Lesotho Boston Health Alliance.

I also note an important on-going regular monthly sessions of Lesotho Learning and Sharing Forum where all Health Professionals come to share and learn from one another. We thank Elizabeth Glazer Pediatric AIDS Foundation for their continued financial support and Lesotho Boston Health Alliance for all the logistics support for the forum.

In conclusion, I wish to express my gratitude to all the Medical Doctors who maintained their membership to the LMA because it is through them that LMA exists and grows from strength to strength. Let us continue to uphold our dedication and commitment as we strive to improve the Medical practice through LMA for the betterment of our Nation; we love to see its health improved for the overall economic development of the country.

Motsoahae Raute Molise



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# Challenged supply chain for medical commodities in Developing countries: the case of malaria commodities in the Mweya District of Kenya

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**Abstract:** Developing countries face an arduous task of addressing supply chain issues for medical commodities. This report follows the experiential training in malaria prevention, control and management and the field visits in the District Hospital and homesteads of the Mweya District of Kenya, carried out from July 23-August 3, 2012. These activities were sponsored by UNDP Lesotho & the International African Medical and Research Foundation (AMREF) in Nairobi, Kenya. The work also draws from experiences elsewhere. Problems range from outright shortage following insufficient funding of the health sector, shortage of personnel and skills, to a skewed distribution, with generally less supply to rural areas that are furthest from the central hub (in the capital cities). There is need for better management of medical commodities, in order to sustain a basic support of Public Health in countries of the developing world, and to address many of the UN MDGs.

Key words: Supply chain management; Medical commodities; Public Health

## Introduction

The supply chain management or logistics for products (goods and services) have been known to present enormous challenges globally (Simchi-Levi et al., 2004; Kampstra et al., 2006). This is notably so for many developing countries (World Bank, 2013), especially where the catchment area (total area to be served) is large.

Kenya is a tropical East-African country, and is a good breeding for the Anopheles mosquito, which is the malaria vector. This is especially true in regions that generally stay hot and humid, such as the Mweya District of Kenya. Malaria is a major health burden in the country, and generally worldwide. This burden gets exacerbated by climate change, letting the disease vector to thrive even in previously free regions.

Globally, in the past few years, attempts have been made to control malaria through the use of insecticide-treated nets, indoor residual spraying (IRS), prompt diagnosis and appropriate treatment. These have resulted in significant reductions in mortality and morbidity in many countries, although in other places such as in Kenya, the disease continues to be the primary cause of illness and death.

In the last decade, the number of malaria cases globally has risen at an alarming rate, particularly in Africa (WHO, 2010). WHO estimates that there are 300 million malaria cases annually, resulting in 1.1 million deaths, of which 86% occur in sub-Saharan Africa. About 71% of these deaths were among children less than 5 years of age and

pregnant women. Indeed, between 1994 and 1996, outbreaks of malaria in 14 countries in sub-Saharan Africa caused an unexpectedly high number of deaths, many in areas previously free of the disease (Johns Hopkins University, 2001).

In Kenya, medical commodities are sourced and distributed from Nairobi, the capital, to the various districts by a government parastatal called the Kenya Medical Supplies Agency (KEMSA) (Aronovich and Kinzett, 2001; World Bank, 2013). KEMSA is concerned with forecasting, procurement, warehousing and distribution of medical commodities for the Government of Kenya in the Public Health sector. It is, however, noteworthy that some donors nourish the district supply chain for medical commodities directly, in an effort to promote decentralization. Indeed, the provision of public health commodities in Kenya has ended up being a very complicated supply chain (World Bank, 2013).

Some previous research has been carried out in developing countries to identify issues that complicate the supply of medical commodities. For example, Ambe and Badenhorst-Weiss (2012) studied the challenges that the South African Public Sector faced in connection with the effective implementation of supply chain management of goods and services in the public sector. They identified restraining factors that included lack of knowledge, lack of skills, existence of fraud, and other contributors. Kachwee and Hartmann (2013) undertook a study to seek solutions to the constraints imposed on the pharmaceutical supply chain of one of the largest and busiest state-owned hospitals in South Africa, attempting to identify the major sources of waste and inefficiency and to quantify wastage.

Knowing of the badly managed medical supply chains in many African countries, the World Bank (2013) took upon itself to strengthen the health care systems in Kenya, Lesotho and Mozambique, using South Africa as example for best practice.

The main objectives of this study was to investigate, in an exploratory way, and understand the management of the medical supply chain at the Mweya District hospital in terms of malaria pharmaceuticals (drugs) and Insecticide Treated Nets (ITNs) movements. A household survey was also done in the District, in order to assess the coverage level of ITNs among children and women.

### **Methodology**

A case study research (Yin, 1987) was undertaken which investigated the supply chain and inventory situation of malaria commodities at the hospital units (Pharmacy, Inpatient clinic, Outpatient, Laboratory) and 20 households. A structured questionnaire was developed for each unit of the facility and the households, and data was generated through on-the-spot questionnaire interviews. Respondents came from the hospital units mentioned above and from randomly selected 20 households in the Mweya community. The respondents included a medical doctor, pharmacist and pharmacy staff, patients, nurses, ward staff, laboratory staff, and household members. The questions addressed general satisfaction levels in terms of service delivery and stock availability.



To address the commodity management cycle for malaria commodities at the pharmacy, the quantification approach was used. This approach is shown by the consumption based and morbidity based quantification methods (Thiam, 2012) below:

a) Consumption method;  $Q_0 = AMC*(LT+PP) + SS-(SH+SO)$  *Equation i*

Where;

Q<sub>0</sub> is the Quantity required

AMC is the Average Monthly Consumption of the commodity, measuring how much is used on average per month, using the sum of quantities dispensed over a period of time, normally 12 months

LT is Lead Time or waiting time

PP is Procurement Period

SS is the Safety Stock (usually as time)

SH is the Stock on Hand

SO is the Stock on Order

b) Morbidity method:  $Q = AST*NME$  *Equation ii*

Where;

AST is the Average Standard Treatment, i.e., the quantity of the drug specified for a standard course of treatment

NME is the Number of Disease (e.g. Malaria) Episodes

It is noteworthy that the consumption forecasting model was what was used to quantify stock.

Mainly an exploratory approach has been employed here, to give a feel of the problems that complicate the supply chain, and the complete data and results of this research are to be published elsewhere.

### Results and Discussion

An efficient medical supply promotes effective health care and inspires confidence in the health system (World Bank, 2013). Practices should aim at ensuring timely availability of medical products, and the appropriate use of safe, effective, quality medicines and related goods and services in any health care setting (Thiam, 2012).

With inefficient inventory management, stock outs, as were seen on the field in Kenya, become regular (Kachwee and Hartmann, 2013). Asking about Insecticide Treated Nets (ITNs) in the Ante Natal Clinic (ANC), it was said that there had been stockouts in the past several months. This was a very deplorable situation, as there were a good number of newborn babies and mothers in the maternity unit in this highly mosquito infested area.

Up to three quarters of the households visited had ITNs for babies and women, but it was noted that the community members would hardly use them. This calls for a strong drive in health education and promotion. Some inhabitants did not have a basic understanding of the malaria vector, calling for further awareness raising and general advocacy.

The laboratory was generally well equipped for the level of the health facility, but testing chemicals and other pharmaceuticals could not be efficiently tracked, which lead to shortages. A similar situation was reported by outpatients, saying they would sometimes visit the facility for drug purchase and would be told there is stockout.

The pharmacy and storage rooms were generally clean and dry, but with sub-optimal ventilation. Conditions of commodity storage (arrangement) are crucial (e.g., Ramathebane et al., 2012) in medical commodity management, because a product can actually be present at a facility but unfit for use due to premature deterioration of its efficacy or other complications. Also, if a non optimal storage or stocking is used, the exit (use) of commodities in relation to their arrivals can be faulty. Such calls for, apart from other requirements, adequate storage temperature, air conditioning, and good rotation on a First-Expiry-First-Out (FEFO) basis, especially with drugs.

Some malaria commodities, such as Artemether Lumefantrine (AL<sub>1-4</sub>), Quinine (oral and injectable) and SP were available, but the sufficiency of the stocks and the supply chain processes could not be trusted. There was outright stockout of important commodities like Dihydro artemisinin-piperaquine & injectable Artesunate/Artemeter. Rapid Diagnostic Test (RDT) was unknown to facility staff and only microscopy was used in malaria testing. This could delay processes. Inventory management is at the core of managing the supply chain (World Bank, 2013)

The provision of health commodities in Kenya has ended up being a complicated supply chain at best, with numerous stakeholders. These complications limit the successful practices found on the ground. Challenges include lack of proper training in logistics and supply chain management of staff, bureaucracy, among others (Ambe and Badenhorst-Weiss, 2012).

In a similar situation as Kenya is the Kingdom of Lesotho, where, during a Health Research workshop in October 2013 convened by the Ministry of Health (MOH) with stakeholders from health units of all the ten Districts of the country, there was also a general cry that the supply chain management of medical commodities was at best inadequate. This, given the challenging mountainous landscape of the country, was made worse by the poor states of roads leading to the rural clinics. The situation of a compromised supply chain for medical commodities is also found in Cameroon, another developing country in Africa.

Efficient medical supply can be hampered by many challenges that include lack of knowledge, lack of equipment, poor supply chain process quality control, size of catchment and catchment layout, among others. The problems range from outright shortage following insufficient funding of the health sector, shortage of personnel and skills, to a skewed distribution, with generally less supply to rural areas that are furthest from the central hub (in the capital cities), and those most difficult to reach, due to bad roads, the season of the year, and possibly a generally rugged terrain, etc.

Availability of malaria drugs and other commodities were also hampered by the lack of resources from the Government of Kenya (GOK) to procure the products, and fraud and corruption (Ambe and Badenhorst-Weiss, 2012).

**Conclusion and recommendations:** An efficient medical supply chain promotes effective health care and inspires confidence in the health system. This is not presently obtainable in Kenya and other African countries like Lesotho, Mozambique and Cameroon, with reasons that include lack of sufficient financial resources, presence of complex setups, lack of knowledge, lack of skills and capacity, presence of bureaucracy & fraud, and lack of efficient

monitoring and evaluation. Apart from the need for better management of medical commodities in connection with supply chain management, there is need for strengthened health education, raising awareness and general advocacy for malaria and other communicable disease management in the Mweya District and elsewhere in Kenya and beyond.

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### Acknowledgements

This research followed the sponsorship of an international course on Malaria prevention, control and management at AMREF, Nairobi, Kenya, by UNDP Lesotho, from 23<sup>rd</sup> July to 3<sup>rd</sup> August 2012. Many thanks thus go to UNDP Lesotho, and also to AMREF that administered the course. All the course mates from Lesotho and other countries are also acknowledged.

# LAPAROSCOPY

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## ABSTRACT:

In last ten years laparoscopy has made a great difference. It has evolved as an informative important method of diagnosis and therapeutic value of wide spectrum.

The use of laparoscopy as a diagnostic modality dates back to early 20th century Following which it has been widely used in the specialities of Gastroenterology, Urology, thoracic surgery, gynaecology and oncology. The use of laparoscopy in evaluation of abdominal trauma was suggested in the early 70's by a number of surgeons but is now being practiced widely for both blunt and penetrating injuries of the abdomen more so with the advent of advancement in technology and the development of fine and high precision of instruments.

In the situation of a patient with abdominal trauma, patients who are suspected to have visceral injury may not be subjected to unnecessary laparotomy if a diagnostic laparoscopy may be available. A laparoscopy instead of a laparotomy can safely and effectively be used as a diagnostic and therapeutic modality. The assessment of a patient with trauma has been delayed in several situations and subjecting such patients to a laparotomy increases the morbidity and mortality.

This increase in morbidity and mortality can be reduced by performing a diagnostic laparoscopy wherein if no significant injury has been seen, an unwarranted laparotomy is avoided, Hence improving the prognosis. Diagnostic laparoscopy also serves as a good tool of evaluation in situations where there is non availability or absence of result clarity of other non invasive assessment tools such as a CT or MRI. Studies [1] have analyzed several aspects of its application on trauma patient. Others studies [2] have expanded its role beyond simply a screening tool for injury, to being used as a diagnostic and therapeutic modality. Now it is utilized for both blunt and penetrating injuries. This article review has been done to emphasize the advantages of minimally invasive techniques over invasive techniques in abdominal trauma.

**KEYWORDS:** Laparoscopic surgery, Acute abdomen, Abdominal trauma, Diagnostic Laparoscopy, Diagnostic laparoscopy versus Laparotomy, Abdominal injuries, Abdominal trauma assessment, Blunt trauma abdomen, Therapeutic laparoscopy.

## INTRODUCTION:

With the advent of fine precision instruments, minimally invasive surgeries have been applied to various specialities. Current use of laparoscopy in the diagnosis and management of trauma patients has been a natural extension of this trend. Being widely utilized for both blunt and penetrating injuries, laparoscopy has gained

popularity in the evaluation and management of patients with penetrating abdominal injuries. The ability of accurate diagnosis of anterior peritoneal penetration from stab and gunshot wounds has been proven. In various centers it is now being used more than just as a diagnostic tool. It is used as a therapeutic modality for non serious, non vascular injuries thereby preventing unnecessary laparotomies. It is an ideal procedure in patients with unclear diagnosis and in the absence of availability of computerized axial tomography (CAT) or MRI, Where there may be a delay in diagnosing abdominal lesions that may require laparotomy for treatment (hollow organ injury, bile leaks, pancreatic lesion, persistent bleeding, etc.).

### **AIM:**

This review is aimed at evaluating the role of emergency laparoscopy as a diagnostic and therapeutic tool in abdominal trauma and to highlight its advantages over an exploratory laparotomy. Diagnostic Laparoscopy and Laparotomy have been compared using the following criteria:

- i. Patient selection
- ii. Operative technique
- iii. Duration of procedure
- iv. Co morbid factors

Intra operative and post-operative complication Post-operative pain and requirement of analgesics Post-operative morbidity and mortality Course of hospital stay and timing of discharge Cost effectiveness Quality of life analysis late complications Return to normalcy.

### **MATERIALS AND METHODS:**

Literature search and review was done using online search engines such as Google, High wire press, Wikipedia, Springer link at the Library in the World Laparoscopic Hospital. Using the above mentioned key words, search was conducted. Selected articles were checked from their references and the universally accepted papers at recognized institutions were considered for this review study.

### **CLASSIFICATION OF ABDOMINAL TRAUMA**

- i. Blunt abdominal trauma (BAT)
- ii. Penetrating abdominal trauma which can be further classified as:
  - a. Low-energy penetrating wounds
  - b. High-energy penetrating wounds

### **Mechanism of injury:**

#### ***Blunt trauma***

The etiology of blunt abdominal trauma (BAT) is dependent on the environment of the receiving institution. The most common cause of BAT in metropolitan trauma centers is the motor vehicle collision (MVC), responsible for 45% to 50% of BATs. Assaults, falls, automobile–pedestrian accidents and work-related injuries are also common

[6]. Abdominal injuries in blunt trauma result from compression, crushing, shearing, or deceleration mechanisms. Fortunately, the incidence of BAT requiring laparotomy is only 6%. The most frequently injured organs are the spleen (40% to 55%), the liver (35% to 45%), and the retroperitoneum (15%) [5].

### **Penetrating trauma**

Gunshot wounds are the most common cause (64%) of penetrating abdominal trauma, followed by stab wounds (31%) and shotgun wounds (5%) [6]. Injury patterns differ depending on the weapon. Stab wounds are generally less destructive and have a lower degree of morbidity and mortality than gunshot wounds and shotgun blasts. The most commonly injured organs are the liver (40%), small bowel (30%), diaphragm (20%), and colon (15%) [5]. Gunshot wounds and other projectiles have a higher degree of energy and produce fragmentation and cavitations, resulting in greater morbidity [7]. These mechanisms result in multiple intra-abdominal injuries of the small bowel (50%), colon (40%), liver (30%), and abdominal vascular structures (25%) [5]. Consequently, exploratory laparotomy traditionally has been warranted for gunshot wounds between the nipple line and the inguinal crease.

## **DIAGNOSTIC MODALITIES**

### **Physical examination**

#### ***Blunt trauma***

Although the physical examination is the first step in evaluating the need for exploratory laparotomy, it has questionable validity in BAT [8]. The initial examination is often unreliable when the effects of alcohol, illicit drugs, analgesics or narcotics, or a diminished level of consciousness are present. The initial abdominal examination results in a 16% false-positive rate, a 20% false-negative rate, a positive predictive value of 29% to 48%, and a negative predictive value of 50% to 74% in determining the need for laparotomy [9]

#### ***Penetrating trauma***

The physical examination is a more reliable indicator for laparotomy in penetrating trauma. In a prospective study, Quiroz et. al identified two thirds of patients requiring laparotomy on initial physical examination. The remaining patients who required laparotomy developed physical findings within 10 hours of injury [10]. In the trauma patient with a stab wound, local wound exploration is a valuable diagnostic aid. Its utility is dependent on the wound's mechanism and location. Stab wounds to the anterior abdomen (anterior costal margins to inguinal creases, between the anterior auxiliary lines) are a clear indication for local wound exploration, because many do not penetrate the peritoneum. Exploration requires aseptic technique and local anaesthesia.

The wound is enlarged as necessary so that the posterior fascia may be evaluated. If penetration occurs or is inconclusive, the wound is considered intraperitoneal. These wounds must be evaluated further by diagnostic peritoneal lavage (DPL) or laparotomy. Laparoscopy may play a vital role in diagnosing if the peritoneal cavity has been breached and if there are any intra-abdominal injuries.

## Radiography

### *Blunt trauma*

The chest radiograph is useful in the evaluation of BAT for several reasons [11]. First, it identifies the presence of low rib fractures. This should heighten the examiner's suspicion for abdominal injuries and mandate further evaluation with an abdomen and pelvis CT. Pelvic fractures should raise the possibility of intra-abdominal injuries, and thus warrant further evaluation with an abdominal and pelvic CT scan [12].

### *Penetrating trauma*

Plain abdominal x-ray in penetrating trauma allows one to account for bullets, shrapnel, and foreign bodies. If all foreign bodies are not accounted for, one must consider the possibility that it is intra-luminal or intravascular. Intravascular foreign bodies are a potential source of emboli, and thus all intra-peritoneal foreign bodies should be accounted for at exploration.

## Focused assessment with sonography for trauma

The focused assessment with sonography for trauma (FAST) examination is an important tool in the evaluation of abdominal trauma. Its portability, speed, non-invasiveness, and reproducibility make it an ideal diagnostic study. It has some limitations, in its dependency on free intra-peritoneal fluid for a positive study. Thus, hollow visceral and retroperitoneal injuries are not detected reliably by the FAST exam [13]. Thus recent studies have questioned its reliability in the evaluation of BAT. Stengel et al performed a meta-analysis of 30 prospective trials evaluating FAST for BAT. They concluded that the FAST exam has an unacceptably low sensitivity for the detection of intra-peritoneal fluid and organ injuries. They recommend that additional diagnostic studies be undertaken in patients with clinically suspected BAT regardless of the FAST results [14] Diagnostic peritoneal lavage.

## CONTRAINDICATION

- i. Hemodynamic Instability
- ii. Mechanical or Paralytic Ileus.
- iii. Uncorrected Coagulopathy
- iv. Generalized Peritonitis.
- v. Severe Cardiopulmonary Diseases.
- vi. Abdominal Wall Infection
- vii. Multiple Previous Abdominal Procedures.
- viii. Late Pregnancy.

## Laparoscopy in Trauma

Laparoscopy was first used for a trauma patient in 1956 by Lamy, who observed two cases of splenic injury. Since then, Gazzaniga et al. [3] noted that laparoscopy is useful for determining the need for laparotomy. In 1991, Berci et al. [18] reported that he had reduced the number of non-therapeutic laparotomies performed for hemoperitoneum by 25% through the use of laparoscopy in 150 patients with blunt abdominal trauma. Sosa et al.



[19] found laparoscopy to be 100% accurate in identifying peritoneal stab wounds. Livingston et al. [20] and Brandt et al. [21] considered laparoscopy of potential benefit for abdominal wounds of unclear trajectory, noting that only 30% to 40% of abdominal stab wounds require surgery. They emphasized the significance of diagnostic laparoscopy for abdominal trauma patients. In another study, laparoscopy had a diagnostic accuracy of 100%, and averted non-therapeutic laparotomy in 82% of the cases. Possible algorithms for use of laparoscopy in the trauma setting are presented in Figs.1 and 2. Laparoscopic evaluation of the abdominal cavity has been established as sensitive and specific in the trauma setting (sensitivity, 94%; specificity, 98%) [22]. Whereas, inspection of the abdominal cavity and solid viscera is relatively easy to perform, complete examination of the intestine presents a greater challenge, with a 9% to 18% missed injury rate per patient [23].

Careful and complete inspection of the bowel and its mesentery is essential if laparoscopic trauma examination is to be reliable [24]. It must be kept in mind; however, that it is easy to miss small bowel perforations and retroperitoneal injuries to the colon. Ivatury et al. reported that only 20% of bowel injuries are identified specifically at the time of laparoscopic examination. Three studies, those of Brandt et al. [21], Rossi et al. [25], and Mazuski et al. [23], showed that 45 of 109 patients had missed injuries, resulting in a 41% missed injury rate per patient. The key to success is an extremely disciplined appraisal of the findings, and the surgeon should not hesitate to do an exploratory laparotomy if he or she is not 100% certain that there are no missed injuries.

Other study shows, One hundred and eight patients were evaluated for penetrating thoracoabdominal injuries (80 stabs and 28 gunshots) over the study period. 22 (20%) diaphragmatic injuries were identified. These were associated with injuries to the spleen (5), stomach (3) and liver (2). There was a greater incidence of haemopneumothorax (HPTX) in patients with diaphragmatic injury (32%) compared to those without injury (20%). 29% of patients with a HPTX had a diaphragmatic injury. However, 18% of patients with a normal chest radiograph were also found to have

Study evaluated laparoscopy in the trauma population. A retrospective review of all laparoscopies performed in hemodynamically stable trauma patients from 1996 until 2006 was conducted. Mechanisms of injury, perioperative data, and demographic variables were analyzed using descriptive statistics and Student's t test. Exploratory diagnostic laparoscopy was performed on 102 patients. Laparoscopy was negative for 65 per cent of patients; 12 per cent of these were converted to laparotomy due to adhesions, hemoperitoneum, or surgeon preference. None of the conversions revealed intra-abdominal injury at laparotomy. An injury was diagnosed at laparoscopy in the remaining 35 per cent, with 55 per cent conversion rate to repair the injury.

Therapeutic laparoscopy included serosal repair, hemorrhage control, diaphragmatic repair, and other standard laparoscopic treatments. No patient required re-exploration, there were no missed injuries or other complications, and no patient died in this study. Laparoscopy has an important diagnostic and therapeutic role in selected hemodynamically stable trauma patients. Using a minimally invasive approach can reduce the potential morbidity of negative laparotomy (31).

### DISCUSSION

The ability of diagnostic laparoscopy to accurately determine anterior peritoneal penetration from stab and gunshot wounds has been proven. In patients presenting with hemoperitoneum with hemodynamic instability, the management is emergency exploratory laparotomy to check the bleeding. If, on the other hand, the patient is hemodynamically stable, the management is controversial. Such patients usually undergo emergency exploratory laparotomy, and in 15-30% of the cases the operation is unnecessary, as there is spontaneous homeostasis of the lesion producing the hemoperitoneum [3]. In these patients, in order to avoid the unnecessary laparotomy, diagnostic laparoscopy serves as a better tool.

For diagnosis and management of the abdominal injury, current diagnostic methods have a defined sensitivity, specificity, and accuracy, but none of these represents a gold standard. Thus abdominal exploration by laparotomy should not be discarded as an unworthy diagnostic and therapeutic procedure for patients with equivocal and unreliable findings. It is associated with complication rates as high as 40% including a 10% to 40% negative laparotomy rate, a 20% morbidity rate, a 0% to 5% mortality rate, and a 3% long-term risk of bowel obstruction secondary to adhesions. Hence an easier way of acquiring the same information with much reduced rate of complications is offered by Diagnostic laparoscopy.

Laparoscopy has been used frequently as a therapeutic tool in selected trauma patients. Examples of therapeutic laparoscopy include repair of diaphragmatic lacerations, treatment of gastrointestinal perforations, repair of low-grade liver and splenic lacerations; resection of small bowel and colon [15]. Auto-transfusion of collected blood from the hemoperitoneum is another potential application [16]. Fabian et al [17] in a large study of 182 trauma patients reported one suture repair of diaphragmatic injury. Successful laparoscopic repair of small bowel, colon, and rectal injuries, and laparoscopic repair of a small gastric stab wound using hernia stapler have been reported recently [18]. Repair of solid visceral injuries, can be either by the totally laparoscopic procedure, the laparoscopically assisted procedure, or hand assisted laparoscopic surgery (HALS). The complications of laparoscopy in trauma include not only the usual complications of anesthesia and laparoscopy, but also some that are unique to the trauma patient. Fabian et al. [17] reported the development of tension pneumothorax in patients with diaphragmatic injury from positive-pressure pneumoperitoneum. If suspected, pneumoperitoneum is stopped, and an immediate needle thoracocentesis is performed, followed by a tube thoracostomy. The risk of gas embolism in patients with intra-abdominal venous injuries, especially liver lacerations, also poses as a big problem. Smith et al encountered this complication in two patients with injuries of the inferior vena cava tamponaded by clot. This potential problem of laparoscopy has inculcated interest in "gasless" laparoscopy [19] by expansion of the peritoneal cavity by mechanical retractors. It carries added advantage of averting the risks of tension pneumothorax and gas embolism and it facilitates the use of conventional instruments such as haemostats, needles, sutures, and electrocautery with significant cost savings. The major disadvantage of gasless laparoscopy is the excessive cost of the powered mechanical arm and the poor exposure in the lateral gutters [20]. Less expensive apparatus to lift the abdominal wall is expected. The transperitoneal absorption of carbon dioxide may cause

complications such as acidosis, cardiac suppression, atelectasis, subcutaneous emphysema, and increased intracranial pressure, resulting in more profound consequences for the trauma patient [21]. Missed intra-abdominal injuries are among the most frequent causes of potentially preventable trauma deaths. The evaluation and management of abdominal trauma is multifactorial and includes mechanism of injury, location of injury, hemodynamic status of the patient, neurological status of the patient, associated injuries, and institutional resources. Therefore careful selection, high index of suspicion, and a low threshold for laparotomy will provide the patient the benefits of minimal invasive surgery and reducing the rates and morbidity of unnecessary laparotomy. The use of Laparoscopy has cut down the expenses by \$1,059 per patient compared to laparoscopy in patients who would have had negative or non-therapeutic laparotomies. [29] With current technology, Diagnostic Laparoscopy is most efficacious for evaluation of equivocal penetrating wounds [30].

## Conclusions:

Laparoscopy can avoid a number of unnecessary laparotomies and can treat most of the lesions found in hemodynamically stable patients with anterior abdominal stab wounds. Diagnostic laparoscopy is the most commonly performed surgical procedure in case of abdominal trauma and is being done even under local anaesthesia where warranted for early diagnosis or intervention. Its greatest advantage is that it is rapidly replacing exploratory laparotomy even in small medical units.

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# GENDER BASED VIOLENCE AND THE INCREASED RISK OF HIV INFECTION AMONG WOMEN IN LESOTHO

By Jerry Y. Yahaya, MSc

## Abstract

While the Government of Lesotho and her development partners have made considerable advances in improving access to and utilization of healthcare services, life-skills education, workplace programmes, ART services, blood screening, and social protection of orphans, challenges remain in serving women effectively. Available evidence shows that addressing gender equality and gender-based violence can improve HIV and other health related outcomes, health seeking behaviour and partner communication<sup>1</sup>. A range of HIV studies exist as population based surveys, cross-sectional studies to longitudinal studies with biological outcomes. However, very few HIV studies incorporate GBV questions<sup>2</sup>. A meta-analysis of Lesotho's HIV prevention strategies demonstrates that women who experience Gender-Based-Violence (GBV) are more prone to HIV infection than those who have never experienced GBV. Meanwhile, policy and programs do not reflect the interlinked risks and consequences in women's lives. This paper seeks to establish the nexus between HIV and gender based violence (GBV) and identify potential areas for a state-led response.

## Methods

For the purposes of this paper, disaggregated survey data sources were used to analyze the topic under discussion. A systematic review and meta-analysis was employed to assess whether the risk of HIV infection in women in Lesotho is associated with Gender-Based-Violence (GBV). This paper is organized into five sub-sections: the summary; the background; a literature review of previous works on the topic (which includes Gender-Based-Violence, Gender based violence and HIV infection, causes and levels of Gender-Based-violence, the effects of Gender-Based Violence); discussions, recommendations; and conclusions. All the data sets used in this paper are cross-sectional and several approaches were used to identify additional published and unpublished data and literature relevant to this paper e. Searches of large online databases and organizational websites, citation lists in publications, and solicitation of documents from contacts were used to put the fragmented pieces of data together. The use of multiple secondary data sources was needed to allow the verification of the different sources of information and also to find more statistics to use as supporting evidence.

**Objective:** The objective of the paper is to establish the relationship between GBV and HIV infection among women in Lesotho.

**Research Questions:** The paper will address the following research questions:

- i. What factors influence GBV in Lesotho
- ii. How is HIV infection among women in Lesotho influenced by GBV?

<sup>1</sup> Garcia-Moreno C., Amin A., 2012.

<sup>2</sup> Abrahams N., 2012

**Hypothesis:** The following hypotheses are formulated to guide the paper: Increase in GBV is a risk factor for HIV infection among women in Lesotho; multiple sexual relationships is high and a major cause of violence against women in Lesotho; rampant cases of rape poses a high risk of HIV infection among women; and Intimate partner violence poses the risk of low condom usage.

**Limitations:** Although a growing number of studies show association between violence and HIV, they are of mixed quality and cross-sectional data presents less consistent findings. The extent to which one can generalize findings across different epidemic settings is unclear. The data presented in this paper include only a summarized version of the original data. There is considerable information in the original data that cannot be recovered from the summary measures reported in the published reports. If the original data were available, this limitation of using secondary data analysis would disappear. However, the use of the secondary data sources enriched the data analysis and gave a substantial basis for confidence in the validity of the analysis. To inform programming, there is a need for more evidence. In particular, longitudinal studies will be useful to answer questions of causality, measurement of exposure to GBV, and control of confounding variables (male partner variables). More so, integrating violence questions into HIV intervention research will provide a deeper understanding of GBV and HIV linkages. Potential areas for future research could include an operational research to test locally appropriate interventions and models for comprehensive and scalable responses to sexual and intimate partner violence.

### Results

Violence against women is condoned by many men as a result of cultural norms that make men dominate<sup>3</sup>. Factors accounting for interpersonal violence included jealousy, unemployment, availability of weapons, substance abuse, and low levels of education<sup>3</sup>. The findings from the analyses confirmed the hypothesis that multiple sexual relationships is high in Lesotho (24% compared to 10% in the Southern African region)<sup>4</sup> and is directly linked with violence against women. More so, intimate partner violence poses the risk of low condom usage; and forceful sex (rape and coerced) without the use of condom (40.5<sup>4</sup>) is a major contributor to HIV infection in Lesotho<sup>5</sup>. Consent to unwanted sex due to fear of violence or other consequences accounted for 20.5% of coerced violence<sup>6</sup>. Half (50%) of health care providers are seeing victims of GBV at least once in a month in their clinical setting, and a whopping 78% of all the health professionals in the sample have not had training on how to care for victims of GBV<sup>7</sup>.

### Conclusion

Having identified the major causes of GBV in Lesotho, it is imperative to state that the problem has collateral effects on education, economy, health, criminal justice and law enforcement, leadership and capacity for governance, as well as societal productivity and cohesion. Many types of violence are not only predictable but also preventable. Therefore, heightened interest and investment in prevention would confer beneficial returns to the

<sup>3</sup> Ngobale et al. 2013.

<sup>4</sup> CIET, 2008.

<sup>5</sup> GoL, 2009. Lesotho HIV Prevention Response and Modes of Transmission Analysis

<sup>6</sup> Sechaba, 2005

<sup>7</sup> Pentti B. and Malope S. 2011

country and victims of GBV by saving lives, improving health outcomes, and facilitating economic growth that could encourage foreign investments. This in turn may contribute to political, civil, and economic stability in the country. Thus said, friendly health services, integration of GBV into HIV services and community-based interventions that address the causes of GBV, related stigma and cultural norms are recommended.

**Keywords: Gender-based violence, risk of HIV, access, sexual violence, rape, multiple sexual partners**

### Background

Lesotho, a country with a population of 1.8, is home to the third largest number of people living with HIV compared to any country in the world, with an estimated prevalence rate of 23% (320, 000 people) in 2011<sup>8</sup>. Compared to other regions like Eastern Europe where injection drug use primarily drives HIV, heterosexual sex is the primary driver of the HIV epidemic in Lesotho. All around the world, the populations that are most vulnerable to and affected by disease, including HIV, are the poor, marginalized, and/or individuals with relatively low access to economic, political, and social resources. A study by Brown et al in 2006, based on a survey of 936 women in Lesotho, reported that 25% had been victims of sexual assault, while another 31% were reported to have been touched against their will<sup>9</sup>. Thus, Gender Based Violence (GBV) is among factors fuelling the spread of HIV and high rates of physical and mental harm in Lesotho. In this paper, the convergence between GBV and HIV that has presented unprecedented health, development and human rights challenges in Lesotho is discussed.

### Gender-based violence

Gender-based violence is widespread globally and in different settings and various forms. These include sexual violence, the beating and abuse of one in three women at least in their lifetime<sup>10 11</sup>. Sexual Violence in particular involves “any sexual act, attempt to obtain a sexual act, unwanted sexual comments or advances, or acts to traffic a person's sexuality, using coercion, threats of harm or physical force, by any person regardless of relationship to the survivor, in any setting, including but not limited to home and work”<sup>12</sup>. GBV is caused and perpetuated by deeply-rooted factors including poverty, social acceptance, tolerance, weak actions against perpetrators and traditional gender norms with prevailing male dominance<sup>13</sup>. Exposure to GBV among women increases the chances of high risk sexual practices such as forced sex and non-use of contraception such as condoms. GBV is a fundamental violation of a woman's human rights and has a direct impact on women's health and wellbeing<sup>14</sup> including negative health outcomes like high risk of HIV infection as perpetrators are likely to force unprotected sex<sup>15</sup>.

<sup>8</sup> UNAIDS, HIV and AIDS Estimates, 2011 <http://www.unaids.org/en/regionscountries/countries/lesotho/>

<sup>9</sup> Brown, L. et al. 2006. Sexual violence in Lesotho. *Studies in Family Planning* 37(4): 269-280.

<sup>10</sup> World Health Organization. Media center fact sheet on violence against women. 2011

<sup>11</sup> WHO, LSHTM, South African MRC (2013) Global and regional estimates of violence against women: Prevalence and health effects of intimate partner violence and non-partner sexual violence.

<sup>12</sup> World Health Organization. Media center fact sheet on violence against women. 2011

<sup>13</sup> Megali Bouchon. France: Imprimeries Paton; 2009. Practical Approach for violence against women: gender, culture and society.

<sup>14</sup> Ibid

<sup>15</sup> Beati Mboya et al. 2012. Access to HIV prevention services among gender based violence survivors in Tanzania, Pan African Medical Journal - ISSN 1937-8688



Compelling evidence shows a direct link between GBV and HIV infection, particularly in young women. Evidence from a study conducted in Tanzania in 2001 revealed that HIV-positive women were over 2.5 times more likely to have experienced violence at the hands of their current partners than other women<sup>16</sup>. Similarly, a longitudinal study published by Jewkes et al, (2010), established that over time, experiencing violence in an intimate relationship is related to increased risk of becoming infected with HIV<sup>17</sup>. In Lesotho, it is estimated that at least one-quarter of women have ever experienced gender-based violence<sup>18</sup>. Despite the association between GBV and HIV, the issue has not been given the needed attention it deserves. Thus said, this crime continues to exist albeit limited access to GBV related services.

### GBV and HIV Infection

There is increasing recognition that violence is both a cause and consequence of HIV transmission. A recent study demonstrates that there is a 1.5 times higher risk of acquiring HIV if a woman has experienced intimate partner violence<sup>19</sup>. GBV is associated with the increased risk of STI and HIV through a number of indirect pathways. This risk occurs both through direct infection as a result of rape and coerced sex and indirectly as a result of women's inability to protect themselves, seek health care and increased risky behaviour and substance abuse<sup>20 21 22</sup>. Research in Rwanda, Tanzania and South Africa indicate that vulnerability to HIV among women who have experienced violence may be up to three times higher than among those who have not<sup>23</sup>.

Findings from a study carried out in Tanzania suggest that young HIV positive women were ten times more likely to have had a violent partner compared to HIV negative women their own age<sup>24</sup>. According to the International Labour Organization (cited in Chapell and Di Martino V, 1998), "...in general, the orientation of a culture, or the shared beliefs within a sub-culture, helps define the limits of tolerable behaviour. If society values violence, attaches prestige to violent conduct, or defines violence as normal or legitimate or functional behaviour, the values of individuals within that society will develop accordingly. Attitudes of gender inequality are deeply embedded in many cultures and rape, domestic assault and sexual harassment can all be viewed as a violent expression of the cultural norm." Justifications for violence are largely based on gender norms, that is, social norms about the proper roles and responsibilities of men and women. These cultural and social norms socialize males to be aggressive, powerful, unemotional, and controlling, and contribute to a social acceptance of men as dominant. Similarly, expectations of females as passive, nurturing, submissive, and emotional also reinforce women's roles as weak, powerless, and dependent upon men. The socialization of both men and women has resulted in an unequal power relationship between men and women. In effect, the socialization of men may mean that they will not seek HIV

<sup>16</sup> Myra Betron. Elizabeth Doggett. A Review of Risk Factors and Promising Interventions. 2008

<sup>17</sup> van der Straten A, King R, Grinstead O, Vittinghoff E, Serufilira A, et al. (1998) Sexual coercion, physical violence, and HIV infection among women in steady relationships in Kigali, Rwanda. *AIDS and Behavior* 2(1): 61–73.

<sup>18</sup> Brown, L. et al. 2006. Sexual violence in Lesotho. *Studies in Family Planning* 37(4): 269-280.

<sup>19</sup> Ibid (i).

<sup>20</sup> Jewkes R., 2010, Gender Inequities Must Be Addressed in HIV Prevention. *Science*, 329(5988):145-147.

<sup>21</sup> WHO, UNAIDS (2010) Addressing Violence Against Women and Achieving the Millennium Development Goals.

<sup>22</sup> Decker M. R et al (2009) Intimate Partner Violence Perpetration, Standard and Gendered STI/HIV Risk behaviour and STI/HIV, Diagnosis Among a Clinic Based Sample of Men. *Sexually Transmitted Infections* 85 (7).

<sup>23</sup> WHO, UNAIDS (2010) Addressing violence against women and HIV/AIDS: What works?

<sup>24</sup> UNAIDS, The Global Coalition on Women and AIDS, *Stop Violence against Women Fight AIDS*, Issue 2, 2007.

services due to a fear of stigma and discrimination, being perceived as "weak" or "unmanly". They therefore end up infecting their partners.

Discrimination and violence render women and girls far more susceptible to HIV infection. Coerced or forced sex increases the risk of HIV transmission due to tears and lacerations resulting from the use of force. The injuries that go with violent and coerced sex offer a perfect conduit for HIV transmission. Because they are often so powerless, women may be unable to negotiate the conditions under which they have sex with their husbands or partners. Male partners may become violent if women refuse their sexual advances. Under these unequal conditions, women, especially young women, are not in a position to demand that their partners use a condom or other forms of protection.

Additionally, gender-related barriers in access to services prevent women from accessing HIV prevention, treatment and care. Women may face barriers due to their lack of access to and control over resources, childcare responsibilities, restricted mobility and limited decision making power. A study in Uganda found that many women were afraid to access HIV/AIDS services for fear of being physically assaulted or threatened by their husbands or partners.<sup>25</sup>

Again, the culture of silence and stigma that has sprung up around HIV/AIDS in Africa and elsewhere mean that women do not seek information about the disease or go for testing. In sub-Saharan Africa, nearly 60 per cent of adolescent girls surveyed were afraid to discuss the use of condoms with their parents for fear of violence.<sup>26</sup>

### Causes and Levels of GBV

There are many myths about GBV that attempt to explain or justify it. Common myths include: The perpetrators of violence are a minority group of mentally ill men; Poverty or war leads to attacks on and abuse of women; Violence against women is caused by substance abuse, such as drugs and alcohol; Violence against women is an inevitable part of male-female relations; and Violence against women is an inherent part of maleness, or a natural expression of male sexual urges. Such views lead to a perception that GBV is rare or exceptional, and/or that it is caused by factors outside of men's control. This view places the onus on women to ensure that they minimize the chances of their behaviour in instigating violence.

There are different types of GBV, which occur at different levels like within the family, in the wider community and state and it affects women and girls disproportionately. A wide range of studies suggest that several factors at each of these levels, while not the sole cause, may increase the likelihood of GBV violence occurring<sup>27</sup>.

At the individual level these factors include the perpetrator being abused as a child or witnessing marital violence in the home, having an absent or rejecting father, and frequent use of alcohol.

<sup>25</sup> Human Rights Watch, *Just Die Quietly: Domestic Violence and Women's Vulnerability to HIV in Uganda*, August 2003, pp. 2-40.

<sup>26</sup> Op. cit. 7.

<sup>27</sup> studies cited in Population Reports/CHANGE, Volume XXVII, No. 4, December 1999

At the level of the family and relationship, cross-cultural studies have cited male control of wealth and decision-making within the family and marital conflict as strong predictors of abuse. Domestic violence, which typically occurs when a man beats his female partner, is the most prevalent form of gender-based violence and this occurs within families and inside homes.

At the community level, women's isolation and lack of social support, together with male peer groups that condone and legitimize men's violence, predict higher rates of violence. Violence against women within the general community includes battery, rape, and sexual assault, forced treatments and the exploitation and commercialization of women's bodies.

At the societal level, physical, sexual and psychological violence are too often perpetrated or tolerated by states that prioritize custom or tradition over the respect for fundamental freedom. Violence against women is most common where gender roles are rigidly defined and enforced and where the concept of masculinity is linked to toughness, male honour, or male dominance. Other cultural norms associated with abuse include tolerance of physical punishment of women and children, acceptance of violence as a means to settle interpersonal disputes, and the perception that men have "ownership" of women. The social exclusion of women in some parts of the world in general is an example of the violence against women that is perpetrated by the state.

### **Effects of Gender-Based Violence**

While women are usually the immediate victims of gender violence, the consequences of gender violence extend beyond the victim to the society as a whole. Gender violence threatens family structures: children suffer emotional damage when they watch their mothers and sisters being battered; two-parent homes may break up, leaving the new female heads of household to struggle against increased poverty and negative social repercussions.

### ***The impact of gender-based violence on women's health:***

Gender-based violence has been linked to many serious health problems, both immediate and long-term. These include physical and psychological health problems. Some of the physical problems include injury, chronic health problems, sexual and reproductive health problems (contracting sexually transmitted diseases, spread of HIV/AIDS, etc.), and death. The psychological problems on the other hand are manifested in the form of anxiety, fear, mistrust of others, inability to concentrate, loneliness, post-traumatic stress disorder, depression, suicide, withdrawal, and alcohol or drug use.

### ***Economic and social impacts:***

The economic and social impacts include: reduced ability to participate in social and economic activities; Acute fear of future violence, which extends beyond the individual survivors to other members of the community; Damage to women's confidence resulting in fear of venturing into public spaces (this can often curtail women's education, which in turn can limit their income-generating opportunities); Increased vulnerability to other types of gender-

based violence; job loss due to absenteeism as a result of violence; and Negative impact on women's income generating power<sup>28</sup>.

### Result and Discussion

Analysis of the data demonstrates a strong indirect link and correlation between GBV and HIV. For instance, data presented suggests that women particularly young girls in Lesotho experience all types of gender based violence such as being beaten by their partners, being denied the right to make their own decision, coerced sex and rape. Between 25%<sup>29</sup>- 61%<sup>30</sup> of the sample reported to have experienced sexual violence at some point in their lives. Over Forty percent (40.5%) reported experiencing some form of coerced sex and 50% experienced assault<sup>28</sup>. Twenty-two percent of the sample reported being physically forced to have sexual intercourse at some point in their lives (Sechaba, 2005). However, Andersons et al. (2007) found that 36% of Basotho men and women believe that "forcing sex with someone you know is not rape", and similar numbers said that forcing a partner to have sex is not rape. This situation could possibly trigger the risk or directly increase the chances of a woman or girl contracting HIV, given that the man might not wear a condom. Additionally, forced sex creates a higher risk of genital injury and bleeding, increasing the risk of HIV transmission.

Besides, 62.5% of the men felt it was unacceptable for a woman to refuse to have sex with her husband; 16.5% felt it was acceptable to force sex on their spouses; and, 28.7% felt it was acceptable to have sex with another woman besides their wives. Mamolibeli et al. (2012) reports in a study conducted in the Qachas Nek district of Lesotho, how a school girl was gang-raped by a group of four boys because she rejected the love proposal of one of the boys. Though some students saw this gang-rape, none of them came to rescue her.

Moreover, abusive relationships (including other forms of abuse besides that of a physical nature) may increase a woman's risk of getting infected with HIV. This risk is manifested both through direct infection as a result of rape and coerced sex and indirectly as a result of women's inability to protect themselves, seek health care as well as increased risky behaviour and substance abuse. Where partner violence and sexual coercion exist, negotiation for condom use (or partner's sexual behaviour) is difficult, thus increasing the risk of HIV infection<sup>31</sup>. Indeed, social meanings around condom use further limit the effectiveness of using condoms as an intervention<sup>32</sup>. For instance, some men still hold negative attitudes towards condoms, believing that condoms diminish sexual pleasure (45%), are inconvenient to use (37%), are embarrassing to buy (34%), but also that people who use condoms are not faithful (33%), or that condoms contain HIV (27%)<sup>33</sup>. Though 86.9% of adult women and 79.8% adult men knew that using condoms could prevent the transmission of HIV from one sexual partner to another, only 37.5% of females

<sup>28</sup> Njenga (1999:6)

<sup>29</sup> Brown et al, 2006. Sexual violence in Lesotho.

<sup>30</sup> Measure evaluation, 2005 cited in Lesotho HIV prevention response and modes of transmission analysis, 2009.

<sup>31</sup> Jewkes R., Sikweyiya Y., Morrell R., Dunkle K., 2011.; Jewkes R., Morrell R., 2010; Jewkes R., 2010, Gender Inequities Must Be Addressed in HIV Prevention. Science, 329(5988):145-147

<sup>32</sup> GOL, 2009. Lesotho HIV Prevention and Modes of Transmission Analysis. Maseru, LS: UNAIDS/NAC/MOHSW

<sup>33</sup> Lesotho NAC, 2009

## GENDER BASED VIOLENCE

and 50.5% of males reported the use of a condom yet they were reported to be in multiple sexual contacts in the past 12 months<sup>34</sup>.

| <b>Respondents reporting sexual coercion and ultimatums by type of coercion (N=1049)</b> |             |
|--|-------------|
|  | <b>%</b>    |
| <b>Ever experienced coercion (any type)</b>  | <b>40.5</b> |
| Sex because of fear of violence or other consequences                                    | 20.5        |
| Sex pressured by arguments   | 17.8        |
| Sex because of wanting money or gifts  | 9.0         |
| Sex for fear of losing money/gifts   | 7.9         |
| Employer insisted sex prior to employment*   | 5.4         |
| Ever had sex when she didn't want to   | 4.9         |
| Sex with man threatening to end relationship   | 3.9         |
| Sex with man threatening to cease her employment**                                       | 2.9         |
| A teacher threatened bad results if she refused sex                                      | 2.7         |
| Sex with a man who had provided transport  | 1.8         |
| Sex because of being too drunk to stop him   | 1.6         |

\* Excludes 69 respondents who had never tried to obtain employment.

\*\* Excludes 125 respondents who had never been employed.

Source: Sechaba, 2005

Though the recognition of the rights and entitlements of women and girls has changed significantly within the legal system in Lesotho, the Basotho culture to some extent promotes multiple sexual partners for males thus placing the women at risk of contracting the virus<sup>33</sup>. The culture of male dominance is partly blamed for GBV in most communities. Male dominance as a culture is not only a cause of GBV but also an obstacle to health services accessibility and GBV event reporting. Cultural and societal norms limit women's ability to confront partners about sexual infidelities and to resist unwanted sexual advances that put them at risk of HIV infection. These same norms make it difficult for women to leave violent partners.

Andersson et al. (2007) found that having multiple sexual partners was the most consistent risk factor for domestic physical violence across an analysis of eight countries including Lesotho. It is also reported that "HIV-prevalence increases for both men and women in tandem with the number of lifetime sexual partners" in the country. Of all sexually active adult males, 45% reported sexual contacts with more than two partners in the previous twelve months in 2009. During the same year, for sexually active adult women, 25.9% reported multiple sexual partners<sup>36</sup>. The findings of the qualitative study on Gender and Multiple and Concurrent Sexual Partnerships in Lesotho (NAC, UNAIDS, FHI 2008) indicate that a number of different social and economic drivers are perceived to contribute to the formation of concurrent relationships. These include desire for money; economic need; few disincentives; influence of peers and family; population mobility; dissatisfaction with stable partner; sexual greed; and, the role of

<sup>34</sup> GoL, 2011: Lesotho global aids response country progress report status of the national HIV and aids response

alcohol. Women are less likely to discuss with their partners to limit the number of their sexual partners<sup>35</sup>. But for most men, having different concurrent partners was a measure of masculinity and sexual virility. For women, having different partners provided them with a way of gaining assistance with important social or economic needs. Notwithstanding this, infidelity was a huge catalyst for violence. It was the most common trigger for violence in relationships whether real or suspected. Men became violent when they suspected their partner of unfaithfulness or when their partner confronted them about their own sexual infidelities. Where partner violence and sexual coercion exists, negotiation for condom use or about partner's sexual behaviour is difficult, thus increasing the risk of HIV infection. Interestingly, the few women who experienced sexual violence sought out existing services, and a woman's decision to disclose an assault is dependent on the type of perpetrator; disclosure is more common if the perpetrator is a stranger (Sechaba, 2005). Many women choose not to report sexual violence to the police because they face harsh and accusatory questioning from male police officers.

Finally, data<sup>36</sup> on access to health care for GBV victims revealed that some healthcare providers do not have such services at their facilities (41%). Over 30 percent (35.7%) of the providers mentioned psychosocial counseling and referral to social workers, while 18.9% of them gave post-exposure prophylaxis treatment. But 15.7% of the respondents gave HIV counseling & testing, and general medical services. Only 14.5% gave STI test and treatment. Other responses included: emergency contraception (8%), Child Gender Protection Unit (5%), pregnancy testing (5%), legal services (3%), safe houses (2%), support groups (2%), and vaginal swabs to check for sperm (1%). Obstacles to GBV and HIV prevention, care, treatment, and support services included stigma and unwillingness to disclose GBV events in the communities, fear of marital separation and male dominant culture. Lack of confidentiality, inadequate GBV knowledge and skills among health providers, and fear of being involved in legal matters were mentioned to be additional obstacles to service accessibility by survivors.

### Recommendations

The following recommendations have been suggested to help ameliorate the problem of GBV and HIV/AIDS in Lesotho:

**Improvement in Health Care Services** - Training health care providers to recognize and respond to gender-based violence is one of the most important ways of identifying and assisting victims. Not just obstetrician/gynecologists but all health care professionals must learn to recognize the signs.

**Victim Assistance Services** - These are services created or incorporated to respond to gender-based violence, such as battered women shelters; homeless shelters; financial assistance programs; women's police services; victim advocacy programs; rape crisis, domestic violence prevention hotlines; legal services; social welfare programs; psychological support services (including individual counseling and support groups) and teen sexuality programs/health services.

<sup>35</sup> NAC. 2009. Gender and Multiple Concurrent Sexual Partnerships in Lesotho. Maseru, LS: NAC

<sup>36</sup> Pentti B. and Malope S. 2011

**Working with Perpetrators** - Working with the perpetrators of violence (barterer-intervention programs) has been a controversial issue. While victim assistance services are a useful band-aid to address an existing problem, this approach targets efforts at the source of the problem, attempting to change violent men's behaviour.

**Exploring Masculinities** - Programs which address masculinities attempt to explore what "makes a man". The central idea is to educate boys from the earliest age that violence (against anyone) is wrong, that the prevailing definition of masculinity in any society is not the only alternative, and that even though they are physically different, girls are entitled to the same rights and opportunities as boys.

**Media Information and Awareness Campaigns** - The media is a key conduit for making GBV visible, advertising solutions, informing policy-makers and educating the public about legal rights and how to recognize and address GBV. Newspapers, magazines, newsletters, radio, television, the music industry, film, theatre, advertising, the internet, posters, leaflets, and community notice boards.

**Education** - School systems are instrumental in stopping GBV before it starts. Regular curricula, sexuality education, school counseling programs and school health services can all convey the message that violence is wrong and can be prevented. They can also suggest alternative models of masculinity, teach conflict-resolution skills, and provide assistance to children/adolescents who may be victims or perpetrators of violence.

**Faith-Based Programs and Services** - Religious counseling, education programs, study groups and assistance programs can address GBV with their worshippers. Most religions emphasize the importance of peace and tolerance. Framing a discussion of GBV in the context of religious tenets is one way to foster awareness and discussion of the problem. It may also be a way to identify and assist victims who do not feel comfortable talking to a health care provider or police officer.

**Legal Responses** - The criminalization of all forms of GBV including domestic violence, rape, sexual harassment, and psychological violence can be an important step in eliminating it. What remains is the consistent application of these laws, the implementation of penalties, and a greater focus on rehabilitating convicted perpetrators. Other legal responses to GBV have included: legal aid services; training of police and judicial personnel; legal advocacy and lobbying; training of family, criminal, immigration and lawyers.

**Community Networks and Interventions** - A number of studies have shown that involving entire communities in recognizing, addressing and working to prevent GBV is one of the surest ways of eliminating it. To be optimally effective, community networks must bring together all of the responses outlined above, integrating members from all sectors of the community: families; businesses; advocacy groups/civil society; public services such as police, fire fighters and medical examiners; social services such as welfare, unemployment, public housing and health; education; the media and officials from national, state/provincial and local/municipal governments. Community interventions must send a clear message about what gender-based violence is, the different forms it can take, why it is wrong and how to prevent it.



## Conclusion

The mechanism through which the interface between GBV and HIV is linked among women in Lesotho has not been properly addressed. Given this, HIV prevention interventions programs have failed to take into account the realities of infidelity, poverty, violence and forced sex in sexual relationships and therefore have had a limited impact. Thus, HIV prevention programs should also be addressed in the context of gender-based violence; otherwise as women continue to face violence, everyone is vulnerable to HIV. Leaders, especially in the health sector, should show a much greater commitment and a greater sense of responsibility towards the information they disseminate regarding GBV and HIV/AIDS.

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# DIETARY HABITS AND LIFESTYLE BURDENS ON CORONARY HEART DISEASE PATIENTS AT PAKI HEALTH CENTRE, MAZENOD, MASERU DISTRICT, LESOTHO

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## ABSTRACT

Coronary heart disease is one of the major causes of death worldwide. The trends where most people have become physically inactive and have resorted to the consumption of food high in saturated fats have led to the progression of atherosclerosis, hypertension, stroke and other ailments.

A study was conducted to determine the effect of diet and lifestyle on coronary heart disease out patients aged between 20-70 years at the Paki Health Center, Mazenod, Lesotho.

The study was cross-sectional and people were selected at random using simple stratified sampling techniques, and a well structured questionnaire was used to collect data on medical and family history, lifestyle behavior, eating habits, as well as demographic information.

The study population of 50 adult patients consisted of more women (76%) than men (24%) and about 55% of the people sampled were 50 years and above in age. With regards to their dietary patterns, most of them (88%) consumed more salt, beef stocks and processed foods and had a monotonous eating pattern. Also, in terms of family and medical history, 92% of the people had a family history of hypertension, 44% had a family history of diabetes and only 36% had a family history of stroke. The nutritional status of the people revealed that 40% of the people were overweight and 26% were obese.

Their dietary patterns and lifestyles did not change much even though they were diagnosed with coronary heart disease and they were still living as though nothing has happened.

**Key words:** Coronary heart disease, nutrition, lifestyle, Paki Health Center, Mazenod

## INTRODUCTION

Coronary Heart Disease (CHD) is a disease of the blood vessels that supplies the heart muscles with blood, oxygen and nutrients (Mackay and Mensah, 2004:30). The impaired blood flow in the coronary arteries results in angina, myocardial infarction, and sudden death (Krummel, 2008:833-864). Coronary Heart Disease is now the leading cause of death worldwide with about 7 million people dying annually. It is on the increase and has become a pandemic which does not respect any borders (Mackay and Mensah, 2004:30). The burden of cardiovascular disease (CVD) in the world is enormous and growing, and the majority of those affected are in developing countries (Brannon and Feist, 2007: 215-243).

In 2010, the estimated number of adults with CHD was 29% (16.7 million), 78% of global mortality, and 86% of mortality and morbidity from CVD occurs in developing countries. By 2020, it is estimated that CVD will become the leading cause of global health burden accounting for 73% of total global mortality and 56% of total morbidity (Brannon and Feist, 2007: 215-243).

Low and middle income countries are at the centre of both old and new public health challenges. They are in many cases experiencing rapid upsurge in chronic disease risk factors and death, especially in urban settings, while dealing with infectious diseases. Lesotho, as one of the low income countries in the Southern African Region, is also experiencing high prevalence of CHD. Indeed, in Lesotho, CHD remains a leading cause of death (Center for Disease Control (CDC), 2004).

There are multiple risk factors that have been highly associated with CHD, this include hereditary, high cholesterol, tobacco abuse, obesity, high blood pressure, diabetes, lack of regular exercise, high fat diet and emotional stress (Mackay and Mensah, 2004:32). Generally there is no cure available for CHD but it can be prevented and managed (Okraimec *et al.*, 2004:15-17; Mendis, *et al.*, 2011: 7-15). CVD results in high morbidity and mortality from diseases such as atherosclerosis, stroke or transient ischemic attack, chronic renal failure, congestive cardiac failure, angina pectoris and myocardial infarction. Therefore, it is important that the necessary measures are employed to prevent, control and also improve the quality of life of those already living with the condition.

The aim of the study was to determine the effect of diet and lifestyle on coronary heart disease out patients aged between 20-70 years at the Paki Health Center, Mazenod, Lesotho.

### METHODOLOGY

This was a cross sectional study involving men and women aged between 25-70 years who had coronary heart diseases. A sample of 50 patients was selected using a stratified sampling, with every fifth person chosen from the group to provide a description of variables in order to determine factors that contributed to the prevalence of CHD of the target population. This was done by observing how much and what kind of foods that group of people ate and how healthy they were. Conclusions were drawn at one point in time on characteristics of those strata. Data was collected using a well structured questionnaire that relates to the topic of the research with the people providing answers in a written form. Both close and open ended questions were used. Study participants were guided by the researcher to help them in answering the questions. Also anthropometric measurements were taken to determine body mass index (BMI) of the people. Data was then analyzed using Microsoft Excel version 2003 and SPSS version 17.0.

### RESULTS AND DISCUSSIONS

#### Socio-demographic data

It was revealed that 76% of people were females while 24% of them were males as shown in table 1. This could probably be due to the fact that women would literally go to the hospital whenever they are sick as compared to men.

Also, the larger percentage of women participating in study could be because there were more women than men according to the 2006 Lesotho Population Census (BOS, 2006: 2-4).

As shown in table 1 (see appendix), percentages of the people between of people were between the ages of 20-40 years, 41-60 years and 61-70 years were 24%, 42% and 17% respectively.

The finding was however in contrast to Rolfes and Whitney (2002:608), who stated that, men have a greater risk of CHD at an early age than women. Brannon and Feist (2007:228) and Mackay and Mensah (2004:32), revealed that advancing age is the primary risk factor for CHD as well as for cancer and other diseases. This is probably because, as people age, they become physically inactive and as a result put on weight and become obese. Also the disease

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progression of atherosclerosis and many CHDs increases with age, hence the probability that many more people above the age of 50 years become susceptible to CHD.

Table 1 also revealed that the percentage of people married, widowed, single and separated were as follows 52%, 32%, 14% and 2% respectively.

**Table 1: Socio-Demographic Characteristics of the Respondents**

| Characteristic           | Percentage |
|--------------------------|------------|
| <b>SEX</b>               |            |
| Males                    | 24         |
| Females                  | 76         |
| <b>AGE (years)</b>       |            |
| 20-30                    | 14         |
| 30-40                    | 10         |
| 40-50                    | 22         |
| 50-60                    | 20         |
| 60-70                    | 34         |
| <b>MARITAL STATUS</b>    |            |
| Single                   | 14         |
| Married                  | 52         |
| Widowed                  | 32         |
| Separated                | 2          |
| <b>EMPLOYMENT STATUS</b> |            |
| Employed                 | 14         |
| Unemployed               | 74         |
| Self employed            | 36         |
| Others                   | 6          |

May be they inherited the condition from their families or they live sedentary lives which could have resulted in weight gain and increase in CHD. Wang, *et al.*(2007:236) stated that women with high level of emotional support and good social integration showed less coronary artery blockage than those with poorer social contacts. CAD patients with only one to three people in their social network were nearly two and one-half times more likely to die of coronary artery disease than patients with four or more close friends. The essence of marriage is for it to provide social support, and in general, married people are at decreased risk for cardiovascular disease. However, the equality of the marital relationship is a factor: women who reported that they were satisfied in their marriage had lower levels of several risk factors than those who were dissatisfied with their marriage.

Majority (74%) of the people were unemployed, 17% employed and 6% were still at school as shown in table 1 (see appendix). Krantz and McCeney (2002:53,341-369 ), established that foods high in saturated fats are cheaper as

compared to foods that are high in monounsaturated fats. They also established that socio-economic status has a relationship to health, CHD and mortality.

Majority (50%) had a primary certificate, 18% had tertiary certificate and 18% of them had COSC and the rest 14 percent had secondary certificate. Brannon and Feist, (2007:215-243), mentioned that, people with low educational level are much more likely to be overweight, have high blood pressure and have less access to health services thus increasing their chances of developing CHD.

### Family History and Duration of Diagnosis

Here the study looked at prevalence of family history of CHD, hypertension, diabetes, stroke and the duration for which people have been diagnosed with their current disease conditions. As presented in table 2, the percentage of people who had family history of CHD, hypertension, diabetes and stroke those who do not have the family history were 48%, 92%, 44%, 36% respectively.

Hypertension is a CHD and this is in consonance with the study by Rolfes and Whitney (2002:266), which stated that, most CHDs involve atherosclerosis, hypertension or a combination of both.

Most of the people 66% have been diagnosed with the condition for over 8 years, 26% for a year and 8% a little over 6 months as shown in table 2 (see appendix).

**Table 2: Family History of Respondents and Lifestyle.**

| Parameter                | Percentage (%) |
|--------------------------|----------------|
| <b>FAMILY HISTORY OF</b> |                |
| CHD- Yes                 | 48             |
| Hypertension – Yes       | 92             |
| Diabetes – Yes           | 44             |
| Stroke –Yes              | 36             |
| <b>ALCOHOL INTAKE</b>    |                |
| Occasionally             | 34             |
| Moderately               | 6              |
| No                       | 60             |
| <b>CIGARETTE SMOKING</b> |                |
| Occasionally             | 8              |
| Moderately               | 6              |
| No                       | 43             |

Family history is also an inherent risk factor for CVD. Certain genetic factors increase the likelihood of developing important risk factors, such as diabetes and hypertension. For example, one genetic variant called apolipoprotein E<sub>4</sub> (Apo E<sub>4</sub>) affects cholesterol levels, particularly those associated with heart disease (Brannon and Feist, 2007:230). Heart disease tends to run in families and people whose parents or siblings develop heart disease at younger age are more likely to develop it themselves.

Rolfes and Whitney (2002:787) stated that most strokes occur as consequences of atherosclerosis, hypertension, or a combination of the two.

Like other inherent risk factors, genes cannot be altered through lifestyle changes, but people with a family history of heart disease can lower their risk by changing those behaviour and lifestyles that can be altered (Brannon and Feist, 2007:230).

### **Eating Habits and Food Frequency Questionnaire**

The study further shows that 88% of people consumed more salt by adding table salt to their food if not seasoned well. Also, about 76% of people used beef stock more often in their food to add taste, thus increasing their salt intake. This shows that there was excessive intake of salt (sodium chloride) which could probably lead to hypertension and consequently CHD. Mackay and Mensah (2004: 34), stated that, an increase in sodium intake causes water retention in the body. This increases blood volume and puts pressure on the arterial walls resulting in high blood pressure and consequently CHD. Furthermore, (Mackay and Mensah 2004:30-38), also mentioned that a high intake of salt also increases the risk of cardiovascular disease in overweight.

Most people 92% ate carbohydrate rich food such as 'pap' (maize meal) 84% ate brown rice and 76% of them ate 'samp' (maize crushed in large pieces) see table 2 in appendix. This shows that most of their daily energy requirement was obtained from refined carbohydrates rich foods which can lead to the body converting excess carbohydrates into fat and thus places an individual to a high risk of obesity and CHD. Smolin and Grosvenor (2000:145), indicated that, excess energy intake increases the risk of heart disease, because it increases body fat, which is a separate risk factor for elevated blood cholesterol levels, high blood pressure, diabetes, and heart disease in general.

The study further revealed that 18% of respondents consumed weetbix, 34% ate corn flakes, 14% ate rice crispies and 14% ate all bran often. This implies that a minority of respondent ate high fiber diets which might decrease the prevalence of CHD. Williams and Schlenker (2003:478), indicate that water soluble types of dietary fiber have a significant cholesterol lowering effect which can help to reduce CHD.

According to Sizer and Whitney (2003: 677), protein rich foods often contain high fat content especially saturated fat, particularly animal protein sources like mutton and beef. Saturated fat is a known contributor of atherosclerosis and CHD.

The results revealed that 68% of people ate poultry without removing the skin, 60% ate sausage, and 56% ate polony, while 52% of them ate pork. This shows that people consumed a lot of protein rich foods high in saturated fat which might increase their chances of contracting obesity and CHD. This predisposes them to long term accumulation of fat in the blood vessels, which could lead to plaque formation and consequently CHD.

In addition, 88% of people consumed full cream milk and 40% ate whole cheese. This also added to their intake of saturated fat, which could lead to atherosclerosis and an increase in the prevalence of CHD, as has been mentioned by Smolin and Grosvenor (2000:145) that diets high in some types of saturated fat increase LDL cholesterol in the blood. Increased LDL cholesterol then increases the risk of atherosclerosis. However, it was further revealed that 76% of people ate beans while 72% of them ate peas. Plant proteins are low in fat and high in fiber, which could help to reduce the incidence of CHD.

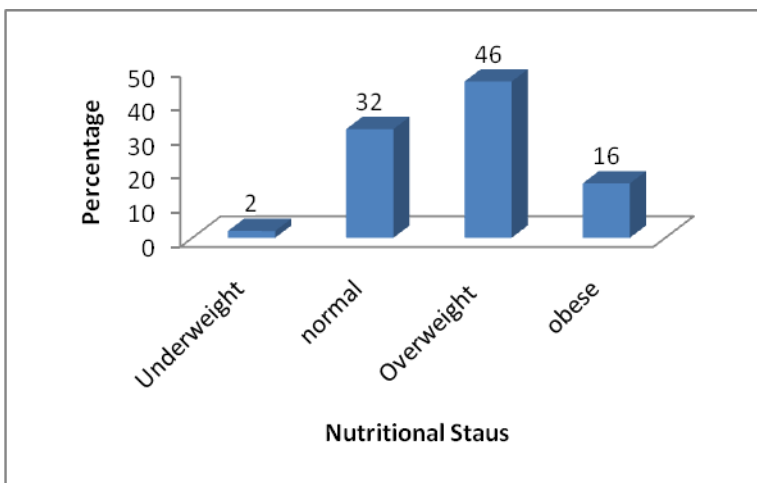


Furthermore, the results show that 90% of people ate fruits and 96% ate green leafy vegetables often, 88% ate carrots, and 86% consumed beetroot frequently. This shows that majority of people had a high intake of fruits and vegetables, a good source of vitamins, minerals and fiber that may help to reduce the prevalence of CHD.

Finally, the results indicated that 98% of respondents use sunflower oil more often, 56% used animal fat, 62% used margarine frequently and 70% consumed mayonnaise more often. High intake of fats and oil lead to the development of CHD. Tull (1999:816), stated that high intake of fat leads to an increase in a variety of chronic diseases including heart diseases and obesity.

### Nutritional Status

Body mass index shows that 40% of the people were overweight, 32% had a healthy weight, 26% were obesity and 2% were underweight as shown in figure 1 below.



**Figure 1 Body Mass Index of Respondents**

Rolfes and Whitney (2008), mentioned that, overweight and obesity, especially abdominal obesity and physical inactivity, significantly modify several factors for CHD, contributing to high LDL cholesterol, low HDL cholesterol, HTN and diabetes. Mackay and Mensah (2004:36), emphasized that a BMI of  $21\text{kg}/\text{m}^2$  may be associated with greater decrease in cardiovascular disease and death.

### Lifestyle Patterns

The findings show that 88% of respondents were engaged in some form of physical activities. Bomar (2004:348), states that exercising lowers high blood pressure, because reducing strain on the heart increases good HDL cholesterol that transports fat away from the arteries and back to the liver, thus reducing the risk of atherosclerosis and CHD.

The results also indicate that 34% of respondents drink alcohol occasionally, while 6% drink alcohol moderately as shown in table 2 (see appendix). The results show that majority of respondents take alcohol occasionally, and this can be one of the causes of CHD. According to Truswell (2003:1,5), alcohol should be taken moderately that is, about one to two drinks per day can be beneficial for middle aged people at risk of CHD, but cannot be recommended for the general population because of the greater danger or accidents in young people and of all the medical complications of excessive intake.

The results further show that 18 % the people still smoked despite their condition (see table 2 in appendix). Smoking prompts the release of nicotine and carbon monoxide which have been identified as the main culprits. These substances are destructive to the inner membrane that protects the walls of the arteries. Once the lining is damaged, cholesterol and triglycerides can be deposited readily in the arterial wall. As the plaque builds up, it obstructs blood flow through the arteries, causing CHD (Hoeger, 2007: 112, 322- 324; Mackay and Mensah 2004:32).

### Conclusion

The dietary patterns and lifestyle of the people did not change despite the fact that they have been diagnosed with coronary heart disease. To ensure longevity, there is a need to modify their dietary patterns and adapt healthier lifestyles, such as increased physical activities, with guidance from experts.

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# PHYTOCHEMICAL CHARACTERIZATION OF SELECTED HERBAL PRODUCTS IN LESOTHO

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## ABSTRACT

Information on herbal products in Lesotho is lacking. The study characterised some herbal products found in Lesotho and compared herbalists' prescriptions with literature. FTIR spectroscopic scan of the herbal products was also done. Phytochemical screening of five powdered herbal products from the Lesotho Herbal Medicines Repository (LHMR) was done using qualitative and FTIR-spectroscopic standard methods. Phytochemical extraction of *Euclea coriacea*, *Hypoxis hemerocallidea*, *Xysmalobium undulatum*, *Senecio asperulus* and *Pelargonium sidoides* was done using water, methanol and acetone as solvents. *Euclea coriacea* was found to contain diterpenes and phytosterols while *Hypoxis hemerocallidea* had diterpenes, flavonoids and phytosterols. Phytosterols, flavonoids, glycosides were detected in *Senecio asperulus*. *Pelargonium sidoides* and *Xysmalobium undulatum* contained glycosides and phytosterols respectively. Although all the herbal plants analysed were found to have medicinal properties, local herbalists' prescriptions of *Euclea coriacea* and *Xysmalobium undulatum* did not concur with literature. Fourier Transform Infra-Red (FTIR) spectroscopy of herbal plants indicated specific spectra which can be used to identify herbal plant components.

## INTRODUCTION

A large number of people in both developing and developed countries rely on herbal products for various ailments (Smith-Hall *et al.*, 2012; Sasidharan *et al.*, 2011). Most rural populations, especially in the developing world, depend on herbal products as their main source of primary health care. It was reported that trade in herbal products is a multi-million dollar business which is a major driver for rural economies (Katerere *et al.*, 2008). A survey in the USA found that people use herbal products because they are natural products, have fewer side effects, are less expensive and milder (Eloff *et al.*, 2011).

Use of herbal products needs to be regulated and coordinated for safety and sustainability (Ajazuddin & Shailendra, 2012). Quality control and stability testing is usually not done in most countries thereby rendering the herbal products unsafe for public use (WHO, 1996). Only 25 of 191 WHO member countries have policies and regulations on use of herbal products (Herman *et al.*, 2013). In Lesotho, the sale of traditional herbal products is not regulated. The use of herbal products by people in Lesotho including those with HIV is believed to be widespread, although insufficiently documented.

Ingredients, dosages, side effects and contraindications of herbal products sold in Lesotho are usually not listed or improperly labeled. In addition, most of the herbal products have multiple indications on the label. Herbal products

can be toxic when inappropriately prepared and prescribed (Haneef *et al.*, 2013). Furthermore, excessive dosages, or prolonged use of some herbal products can have adverse effects (Phua *et al.*, 2009). For example, chronic use of aloe can cause loss of electrolytes (Saka *et al.*, 2012; Yonganandam *et al.*, 2010).

In some parts of the world, people mix herbal products with clinical drugs (Posadzki *et al.*, 2013, Savaliya *et al.*, 2010). Adulterated herbal products are potentially harmful due to adverse interactions with conventional drugs (Haneef *et al.*, 2013; Ernst, 2004). Adulteration of herbal products may have serious effects (Kozyrskyj, 1997). There is also a possibility of misidentification of herbal plants, potential contamination with other plant species products or other ingredients during processing (Khan & Smillie, 2012). Therefore, screening of herbal products for ingredients is important.

The storage conditions for herbal products are usually not specified. The conditions in which plant products are transported and stored may expose the products to bacterial and fungal contamination (Katerere *et al.*, 2008; Temu-Justin *et al.*, 1998). Contamination of herbal products poses health hazards to consumers of the herbal products.

Herbal products usually contain phytochemicals. Phytochemicals are non-nutritive, diversified plant chemicals that have disease preventive or curative properties. They are a lead used in developing new drug entities covering a wide range of therapeutic indications (Kar & Roy, 2012). Limited access to the expensive equipment required for the screening of phytochemicals could be one of the reasons why most countries do not regulate use of herbal products. Affordable, effective and rapid phytochemical screening methods that can detect clinical drugs in herbal products are therefore needed. There are newer analytical methods for phytochemical screening and detection of adulteration in herbal products (Haneef *et al.*, 2013). Fourier Transform Infra Red (FTIR) spectroscopy is one such method (Deisingh, 2005). FTIR analysis is rapid and needs no chemical treatment of samples prior to analysis. According to Sasidharan *et al.* (2011), FTIR spectra of pure plant compounds are unique and the spectra of unknown compounds are identifiable by referring to a library of known compounds.

This study aimed at characterising some herbal products sold in Lesotho using qualitative analysis and comparing herbalists' prescriptions with literature. FTIR spectroscopic scan for the herbal products was also done.

### METHODOLOGY

#### Study design

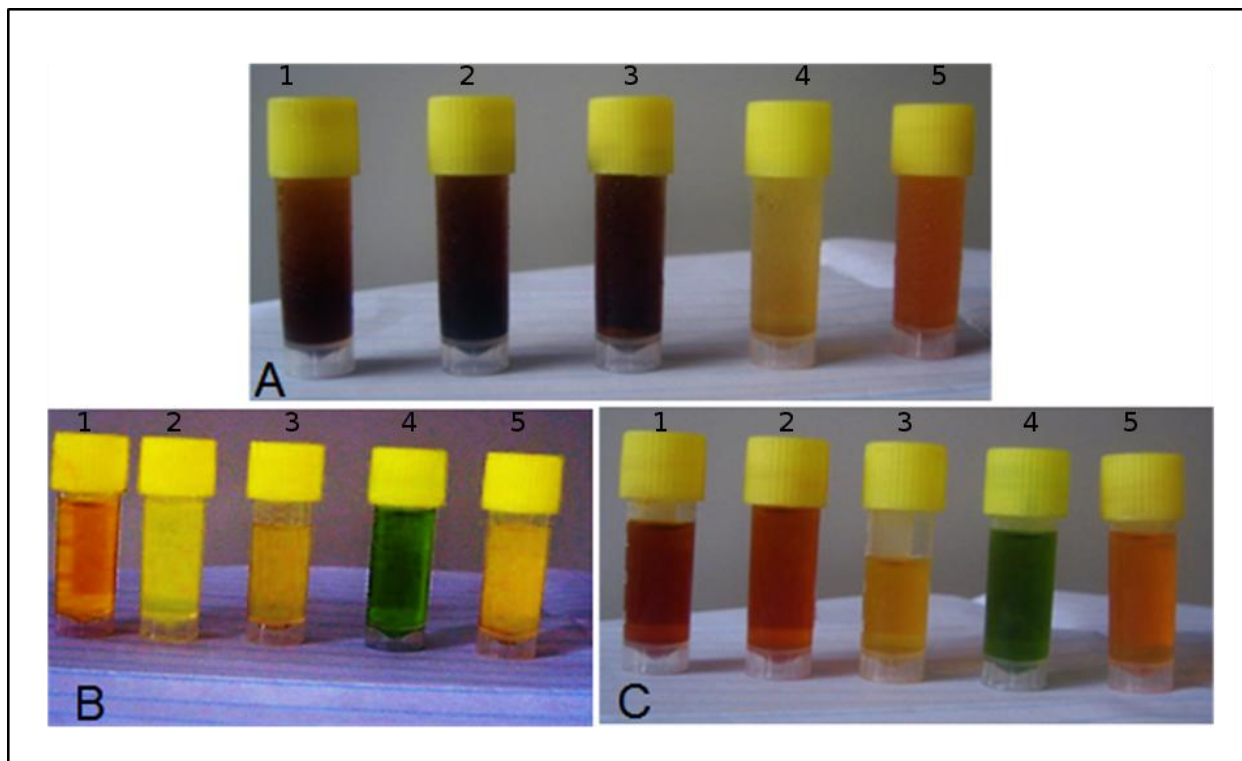
The study involved qualitative and FTIR-spectroscopic screening of five dried powdered herbal products from the Lesotho Herbal Medicines Repository (LHMR) in the Department of Pharmacy at the National University of Lesotho (NUL). The herbs, their indications and plant parts used, according to herbalists, are shown in Table 1.

**Table 1: Names and parts of herbs used in the study and indications given by herbalists**

| Scientific name   | Local name                                | Parts                   | Indication   |
|---|---|-------------------------|--|
| <i>Euclea coriacea</i> (Ebenaceae)                            | <i>Leleme la khomo</i>                    | Roots, leaves and stems | Gonorrhoea   |
| <i>Hypoxis hemerocallidea</i> (Hypoxidaceae)                  | <i>Moli</i> (common name- African potato) | Roots                   | Poor immunity (boosts immune system), chronic wounds |
| <i>Xysmalobium undulatum</i> (Asclepiadoideae)                | <i>Hloenya</i>                            | Roots                   | High blood pressure                                  |
| <i>Senecio asperulus</i> (Apocynaceae, subfamily- Asteraceae) | <i>Moferefere</i>                         | Roots and leaves        | Back pain, swollen feet                              |
| <i>Pelargonium sidoides</i> (Geraniaceae)                     | <i>Pitsa ea litsolo</i>                   | Roots                   | Severe diarrhoea                                     |

### Extraction and screening of phytochemicals

Phytochemical extraction of the herbs was done using water, methanol and acetone as solvents. The method of extraction used was plant tissue homogenization. Portions of each sample (0.5g) were dissolved in 5ml of methanol and acetone separately. For water extraction, the samples (0.5g) were heated in 10ml of water but not allowed to boil. All the extracts were shaken vigorously for 5 minutes and left for 24 hours, after which the extracts were centrifuged for clarification. Then supernatants were separated, bottled (see Figure 1) and stored at -22°C before screening for phytochemicals. Phytochemical screening was done as per the standard methods of the tests shown in Table 2 (Tiwari *et al.*, 2011).



**Figure 1: Water (A), methanol (B) and acetone (C) extracts of plant samples**

1 = *Euclea coriacea*, 2 = *Hypoxis hemerocallidea*, 3 = *Xysmalobium undulatum*, 4 = *Senecio asperulus* and 5 = *Pelargonium sidoides*

### **FTIR-spectroscopic of screening herbal products**

Small amounts (500 mg) of powdered herbal products were crushed until fine powders were obtained using a mortar and a pestle and were sieved with 0.25 mm pore sized sieves. A small portion of each powdered sample (20 mg) and 100 mg Potassium Bromide (KBr) were thoroughly mixed using a mortar and a pestle and loaded on the FTIR spectrometer sample holders. FTIR spectroscopic transmittance spectra were obtained in the region 4500 – 450  $\text{cm}^{-1}$  at resolution 4  $\text{cm}^{-1}$  with 10 scans using Shimadzu IR-Prestige-21 Fourier spectrometer.

**Table 2:** Methods used to screen for phytochemicals

| Phytochemical test                      | Phytochemical tested for | Method   |
|---|--------------------------|--|
| Wagner's test                           | Alkaloids                | The extracts were dissolved individually in dilute hydrochloric acid and filtered, and then the filtrates were treated with wagner's reagent; iodine in potassium iodide.  |
| Borntrager's test                       | Glycosides               | The extracts were hydrolysed with diluted hydrolysed hydrochloric acid and treated with Ferric Chloride solution and immersed in boiling water for about 5 minutes. The mixture was cooled and extracted with equal volumes of benzene. The benzene layer was separated and treated with ammonia solution. |
| Froth test                              | Saponins                 | The extracts were treated with 5ml of distilled and shaken in a graduated cylinder for 15 minutes.   |
| Salkowski's test                        | Phytosterols             | The extracts were treated with chloroform and filtered. The filtrates were then treated with 3 drops of concentrated sulphuric acid, shaken and allowed to stand.  |
| Ferric chloride test                    | phenols                  | Extracts were treated with 3 drops of ferric chloride solution.  |
| Gelatin test                            | tannins                  | The extracts were treated with 1% of gelatin solution containing sodium chloride.  |
| Alkaline reagent and lead acetate tests | flavonoids               | The extracts were treated with few 3 drops of sodium hydroxide solution. The extracts were also treated with few drops of lead acetate solution.   |
| Ninhydrin test                          | proteins and aminoacids  | 0.25% w/v ninhydrin reagent was added to the extracts and boiled for 3 minutes.  |
| Copper acetate test                     | diterpenes               | The extracts were dissolved in water and treated with 3 drops of copper acetate solution.  |

## RESULTS

All screened samples tested negative for alkaloids, phenols, tannins, proteins and saponnins. Phytochemicals that tested positive in at least one of the extracts were flavonoids, glycosides, phytosterols and diterpenes (Table 3).



## PHYTOCHEMICAL CHARACTERIZATION

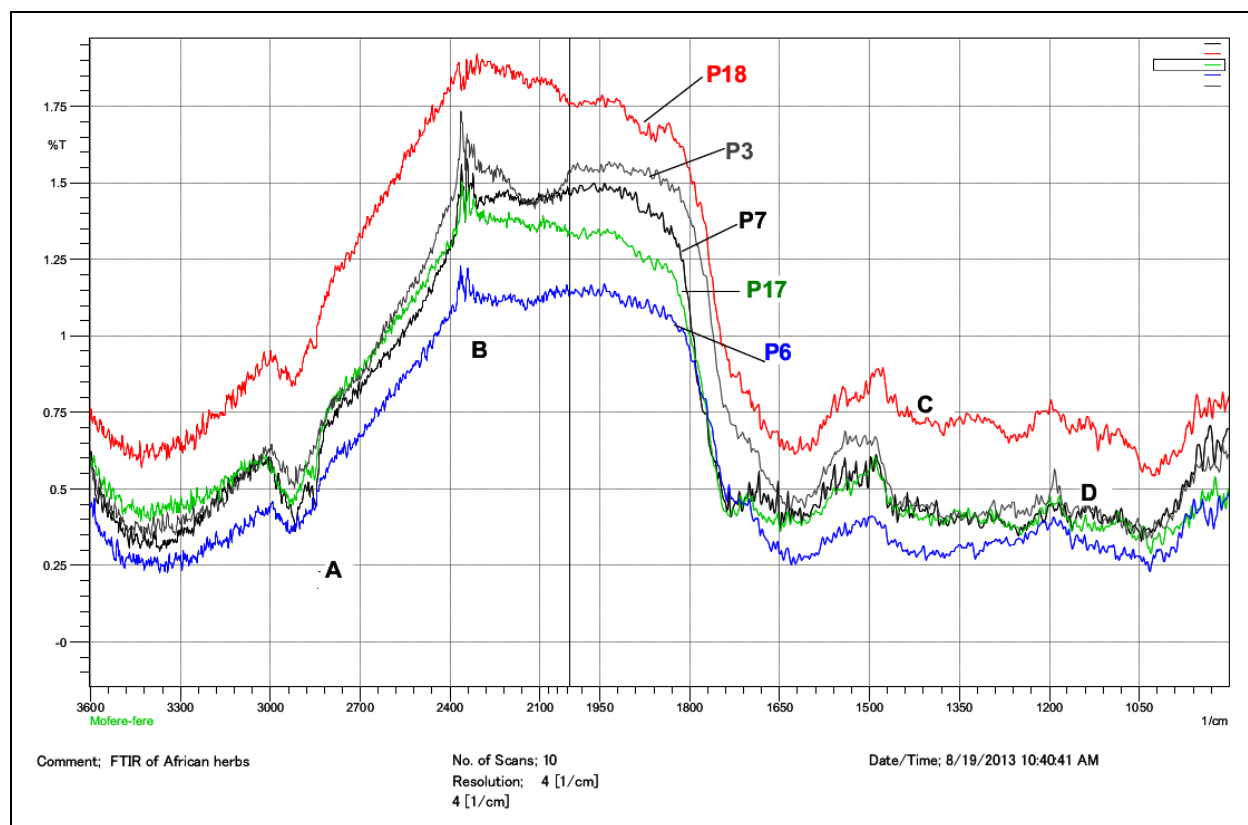
Depending on the solvent used, different plant extracts yielded different phytochemicals. Four of the five plants were found to contain phytosterols. Some plants were found to possess up to three phytochemicals. *Euclea coriacea* was found to contain diterpenes and phytosterols while *Hypoxis hemerocallidea* had diterpenes, flavonoids and phytosterols. Phytosterols, flavonoids, glycosides were detected in *Senecio asperulus*. *Pelargonium sidoides* and *Xysmalobium undulatum* contained glycosides and phytosterols respectively.

**Table 3: Results of phytochemical screening of the herbal products**

| TESTS                             | SAMPLES                       | WATER EXTRACT | METHANOL EXTRACT | ACETONE EXTRACT | INTERPRETATION   |
|-----------------------------------|-------------------------------|---------------|------------------|-----------------|--|
| GLYCOSIDES<br>Borntrager's test   | <i>Euclea coriacea</i>        | Negative      | Negative         | Negative        | Glycosides present in <i>Senecio asperulus</i> and <i>Pelargonium sidoides</i>   |
|                                   | <i>Hypoxis hemerocallidea</i> | Negative      | Negative         | Negative        |  |
|                                   | <i>Xysmalobium undulatum</i>  | Negative      | Negative         | Negative        |  |
|                                   | <i>Senecio asperulus</i>      | Positive      | Negative         | Negative        |  |
|                                   | <i>Pelargonium sidoides</i>   | Positive      | Negative         | Negative        |  |
| PHYTOSTEROLS<br>Salkowski's test  | <i>Euclea coriacea</i>        | -             | Negative         | Positive        | Phytosterols present in <i>Euclea coriacea</i> , <i>Hypoxis hemerocallidea</i> , <i>Xysmalobium undulatum</i> and <i>Senecio asperulus</i> . |
|                                   | <i>Hypoxis hemerocallidea</i> | -             | Negative         | Positive        |  |
|                                   | <i>Xysmalobium undulatum</i>  | -             | Positive         | Negative        |  |
|                                   | <i>Senecio asperulus</i>      | -             | Negative         | Positive        |  |
|                                   | <i>Pelargonium sidoides</i>   | -             | Negative         | Negative        |  |
| FLAVONOIDS<br>Alkaline test       | <i>Euclea coriacea</i>        | -             | Negative         | Negative        | Flavonoids present in <i>Hypoxis hemerocallidea</i> , <i>Senecio asperulus</i> .   |
|                                   | <i>Hypoxis hemerocallidea</i> | -             | Negative         | Positive        |  |
|                                   | <i>Xysmalobium undulatum</i>  | -             | Negative         | Negative        |  |
|                                   | <i>Senecio asperulus</i>      | -             | Positive         | Positive        |  |
|                                   | <i>Pelargonium sidoides</i>   | -             | Negative         | Negative        |  |
| DITERPENES<br>Copper acetate test | <i>Euclea coriacea</i>        | Positive      | Negative         | -               | Diterpenes present in <i>Euclea coriacea</i> , <i>Hypoxis hemerocallidea</i>   |
|                                   | <i>Hypoxis hemerocallidea</i> | Positive      | Positive         | -               |  |
|                                   | <i>Xysmalobium undulatum</i>  | Negative      | Negative         | -               |  |
|                                   | <i>Senecio asperulus</i>      | Negative      | Negative         | -               |  |
|                                   | <i>Pelargonium sidoides</i>   | Negative      | Negative         | -               |  |

A dash (-) indicates that the phytochemical was not tested for because the phytochemical is insoluble in the extract.

FTIR spectra for the plant samples in the region 3600 – 900 cm<sup>-1</sup> at resolution 4 cm<sup>-1</sup> with 10 scans are presented in Figure 2. The spectra obtained showed similar trends for all plant samples with peaks indicated by A – D.



**Figure 2: Characteristic FTIR Spectra from the powdered herbal products**

P03 = *Euclea coriacea*; P06 = *Hypoxis hemerocallidea*; P07 = *Xysmalobium undulatum*; P17 = *Senecio asperulus*; P18 = *Pelargonium sidoides*

## DISCUSSION

The findings of this study confirmed that the herbs contained phytochemicals. All the herbal plants screened contained at least one phytochemical, which implies that these plants may have medicinal properties.

*Euclea coriacea* was found to contain diterpenes and phytosterols. Diterpenes are known to have anti-cancer effects in human cells (Li *et al.*, 2013; Fronza *et al.*, 2012; Pesic *et al.*, 2011). Phytosterols have been demonstrated to have anti-inflammatory (Garcia *et al.*, 1999), antidiabetic (Tanaka *et al.*, 2006) and pain-relief (antinociceptive) (Santos *et al.*, 2011) effects. Therefore, *Euclea coriacea* may have anti-inflammatory, antidiabetic and pain-relief effects. However, herbalists in Lesotho prescribe *Euclea coriacea* for gonorrhoea treatment.

*Hypoxis hemerocallidea* was found to contain diterpenes, flavonoids and phytosterols. Flavonoids have antimicrobial (Dzoyem *et al.*, 2013, Leite *et al.*, 2012, Li *et al.*, 2012) and antidiarrhoeal (Yao *et al.*, 2011) effects. *Hypoxis hemerocallidea* may be prescribed for these conditions. Ojewole (2006) found *Hypoxis hemerocallidea* to

have pain-relief, anti-inflammatory and antidiabetic properties. Nonetheless, local herbalists prescribe *Hypoxis hemerocallidea* for poor immunity and chronic wounds.

*Xysmalobium undulatum* was found to contain phytosterols only. However, this is contrary to the findings by (Ghorbani *et al.*, 1997) who found glycosides in the herb. *Xysmalobium undulatum* may therefore have anti-inflammatory, antidiabetic and pain-relief properties. Herbalists in Lesotho, however, use the herb for the treatment of high blood pressure.

Phytosterols, flavonoids, glycosides were detected in *Senecio asperulus*. Glycosides have antidiarrhoeal properties (Schmiedl *et al.*, 2012; Thurmann *et al.*, 2004). Therefore, *Senecio asperulus* may be used to treat diarrhea, microbial infections, inflammation, diabetes and may have pain-relief properties. Herbalists in Lesotho, on the other hand, prescribe the herb for back pain and swollen feet.

*Pelargonium sidoides* was found to contain glycosides only. Kolodziej (2007) also found *Pelargonium sidoides* to possess glycosides. Therefore, *Pelargonium sidoides* may treat diarrhoea. *Pelargonium sidoides* is known to cure diarrhoea (Noldner & Schotz, 2007). Herbalists in Lesotho also prescribe *Pelargonium sidoides* for severe diarrhoea.

Overall, herbalists' prescriptions of *Senecio asperulus*, *Pelargonium sidoides* and *Hypoxis hemerocallidea* for various ailments concurred with literature. Herbalists' prescriptions that do not concur with literature may have serious implications on human health. The use of herbal products that do not concur with literature places the public at risk of unwanted effects (Kozyrskyj, 1997). For example, this study found *Senecio asperulus* and *Hypoxis hemerocallidea* to contain phytochemicals that have antimicrobial properties. Prescription of these plants by local herbalists may result in the development of antimicrobial resistance in the recipients. To improve concurrence between herbalists' prescriptions and literature, there is need for screening for phytochemicals in more herbs used by herbalists in Lesotho.

The FTIR spectra for the plants indicated that herbal plants have specific spectra which can be used to identify herbal plants. FTIR spectroscopic herbal spectra have been used to identify herbal chemical components using software that enable clustering and discriminative analysis of the phytochemicals (Tong *et al.*, 2011; Suo *et al.*, 2010). Tong *et al.* (2011) proposed application of FTIR spectroscopy for the identification of adulteration in herbal products. Since some people mix herbal products with clinical drugs (Posadzki *et al.*, 2013), adulterated herbal products can therefore be detected using FTIR spectroscopy. The current study did not compare herbal FTIR spectra with reference library compounds. FTIR spectroscopy needs to be coupled with library software to identify chemical components (Suo *et al.*, 2010). Although FTIR spectroscopic analysis in this study could not identify the herbal components including the phytochemicals present in the samples, the spectra suggest absence of adulteration.

## CONCLUSION

All herbal products analysed in the current study were found to possess at least one phytochemical. *Euclea coriacea* was found to contain diterpenes and phytosterols while *Hypoxis hemerocallidea* had diterpenes, flavonoids and phytosterols. Phytosterols, flavonoids, glycosides were detected in *Senecio asperulus*. *Pelargonium sidoides* and *Xysmalobium undulatum* contained glycosides and phytosterols respectively. Although all the herbal plants analysed were found to have medicinal properties, local herbalists' prescriptions of *Euclea coriacea* and *Xysmalobium undulatum* did not concur with literature. Phytochemical screening of herbal products in Lesotho on a wider scale is therefore recommended. FTIR spectroscopy of herbal plants indicated specific spectra which can be used to identify herbal plant components. FTIR spectroscopy may be used to detect adulterated herbal products.

## ACKNOWLEDGEMENTS

We would like to acknowledge the Lesotho Herbal Medicines Repository (LHMR) in the Department of Pharmacy at the National University of Lesotho (NUL) for providing the plant samples used in the study.

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# FACTORS AFFECTING NURSE-PATIENT COMMUNICATION IN THE MATERNITY UNIT AT MOTEBANG DISTRICT HOSPITAL, LESOTHO

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## **Abstract**

This study focused on investigating factors affecting nurse-patient communication in the maternity unit at Motebang District Hospital in Lesotho. The objective was to investigate if there are factors that affect nurse-patient communication, and to explore what those major factors are. Data was collected through interviews and by issuing standardized questionnaires to both nurses and patients. Simple random sampling techniques were adopted to select a study sample of 45 respondents, of which 30 were patients and 15 were health professionals. Having collected data, it was analyzed. This study revealed that communication is frequently affected by various factors in the maternity unit. The study showed that the major contributing factors affecting communication include: (1) Age and gender of nurses (2) Lack of time to talk to patients (3) Use of different languages (4) Working conditions and (5) Nurses' work load. It was therefore concluded that this preliminary evidence suggests that ineffective nurse-patient communication is a prevailing problem in health care services, including in maternity units in Lesotho.

**Keywords:** nurse, patient, communication, district hospital

## **Introduction**

Lesotho is a small landlocked mountainous country forming part of the Southern African Region. It is informally known as the "Kingdom in the Sky," due to its high altitude that ranges between 1,300 and 3,500 metres above sea level, has resulted in a steep landscape, leaving only 30% of land for agricultural production (Lethale, 2005). The population of Lesotho is currently estimated at 2,188,869 people (Carson, 2012). The fertility rate in Lesotho is estimated at 4.1 per woman, with a life expectancy at birth of 58.6 years for males and 60.2 years for females.

Lesotho is divided into administration regions named districts. There are 10 districts in Lesotho and each district has one government hospital (Carson, 2012). The districts are Butha-butha, Leribe, Berea, Maseru, Mafeteng, Mohale'sHoek, Quthing, Qacha's Nek, Thaba-Tseka and Mokhotlong. Motebang District Hospital is one of the government hospitals. It is located in the Leribe district, in the city of Hlotse. The 196-bed hospital serves the second largest catchment of any district hospital, and does over 55,000 outpatient visits and 5,300 inpatient admissions per year. The hospital's eight wards are each serviced in separate buildings, providing comprehensive care for the population's diverse needs (Balzard, 2012). Among the eight wards, there is a maternity department ward, which shall be referred to as the "maternity unit." The maternity unit is the hospital ward that provides care for women during pregnancy and childbirth, as well as for newborn infants. It is considered an emergency department and it is always open, as women deliver day and night.

Communication is a reciprocal process of sending and receiving messages using a mixture of verbal and non-verbal communication skills (Arnold and Boggs, 1995). However, Shepard (2003) suggests that in nurse-patient relationships, communication involves more than the transfer of information. It also involves the transformation of feelings, recognizing these feelings, and letting the patient know their feelings are recognised. In any



communication both parties are involved and responsible (Shepard, 2003). Ineffective communication between nurses and patients is a universal problem which occurs in all health settings in the world, particularly in maternity departments.

If communication is ineffective, it has the power to hurt, confuse or misinform the listener (Joey, 2012). Problems with communication have resulted in women engaging in traditional medicines. Also it can lead women to engage in home deliveries, where they claim to be comfortable being in a familiar environment and where information is appropriately conveyed to them. These home deliveries can have very serious complications, such as primary post-partum hemorrhage (PPH) and puerperal sepsis (Sellers, 2004). According to the study done by Andersin (2007), it has been found that poor communication leads to a shocking number of hospital injuries and deaths. In fact, the organization that accredits hospitals in the United States of America, the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) realized that communication was a major problem that required nationwide correction (Painter, 2010). For all these reasons, it was important for this study to investigate the factors affecting communication in the maternity unit at Motebang District Hospital.

### Methodology

Data was collected from the 15<sup>th</sup> of March, 2013 to the 28<sup>th</sup> of April, 2013 by administering written questionnaires and conducting verbal interviews. Informed consent was obtained and permission was asked to collect data from the hospital management and from respondents. Simple random sampling was used to select 10 nurse midwives in maternity, 30 patients in the antenatal ward, postnatal ward and complications ward, 2 trained nursing assistants working in maternity, 1 EGPAF coordinator, 1 senior nursing officer and 1 nursing manager, for a total of 45 respondents. Verbal interviews were conducted for 15 patients (50% of the patient sample) and 8 nurse midwives (53.3% of the nurse sample). These interviews were done individually for patients who could not read and write and for nurses who were so very busy that responding to a questionnaire would be too time consuming to them. The remainder of the data was collected by standardized written questionnaires.

### Statistical analysis

Data was compiled and then represented graphically with the aid of Microsoft Excel and SPSS. Frequency distribution tables and bar charts were used to represent the data.

### Results and Discussion

**Table 1: Gender of nurses working in the maternity unit**

| GENDER | NUMBER OF NURSES | PERCENTAGE |
|--------|------------------|------------|
| Male   | 2                | 13.3       |
| Female | 13               | 86.7       |
| Total  | 15               | 100        |



## NURSE-PATIENT COMMUNICATION

**Table 2: Percentage of patients who feel they communicate freely and better with each gender of nurses**

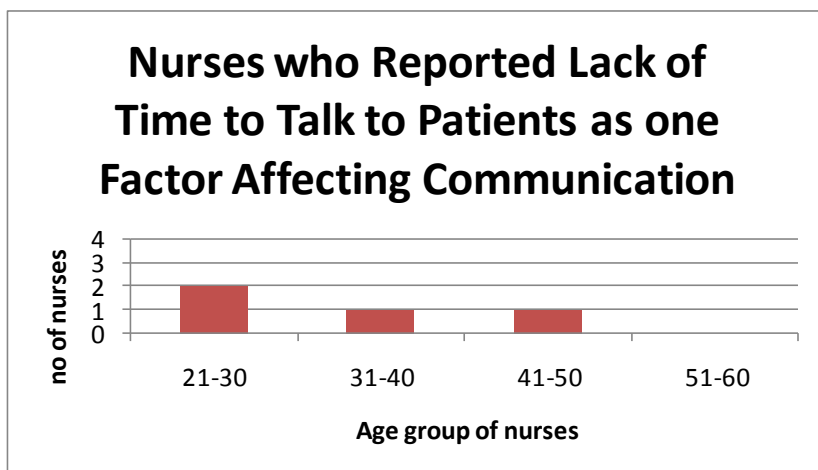
| GENDER OF NURSES | NUMBER OF PATIENTS WHO COMMUNICATE FREELY AND BETTER WITH THE GIVEN GENDER | PERCENTAGE |
|------------------|--|------------|
| Male             | 21   | 70         |
| Female           | 9  | 30         |
| Total            | 30   | 100        |

**Table 3: Ages of surveyed nurses working in the maternity unit**

| AGE GROUP (Years Old) | NUMBER OF NURSES | PERCENTAGE |
|-----------------------|------------------|------------|
| 21-30                 | 7                | 46.7       |
| 31-40                 | 4                | 26.7       |
| 41-50                 | 3                | 20         |
| 51-60                 | 1                | 6.7        |
| TOTAL                 | 15               | 100        |

**Table 4: Percentage of patients who feel they communicate better with different age groups of nurses**

| AGE-GROUP OF NURSES (Years Old) | NUMBER OF PATIENTS WHO COMMUNICATE BETTER WITH THE GIVEN AGE GROUP | PERCENTAGE |
|---------------------------------|--|------------|
| 21-30                           | 1  | 6.7        |
| 31-40                           | 2  | 13.3       |
| 41-50                           | 10   | 66.7       |
| 51-60                           | 2  | 13.3       |
| Total                           | 15   | 100        |



**Figure 1: Number of nurses reporting lack of time as a factor affecting communication**

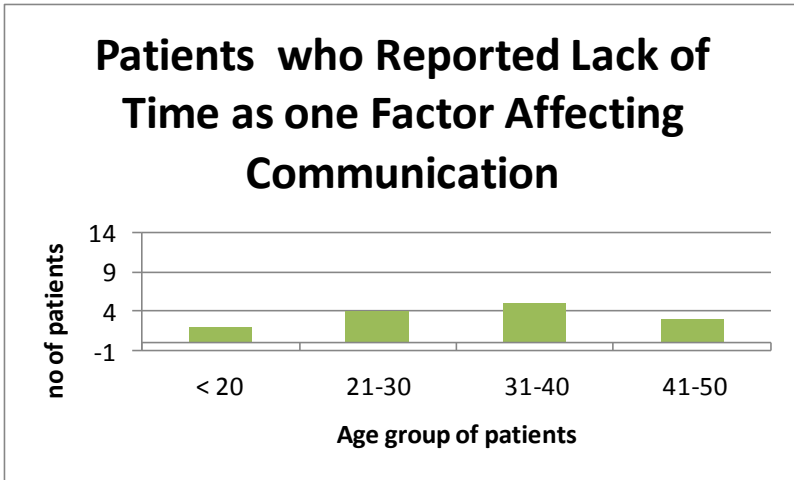


Figure 2: Number of patients reporting lack of time as a factor affecting communication

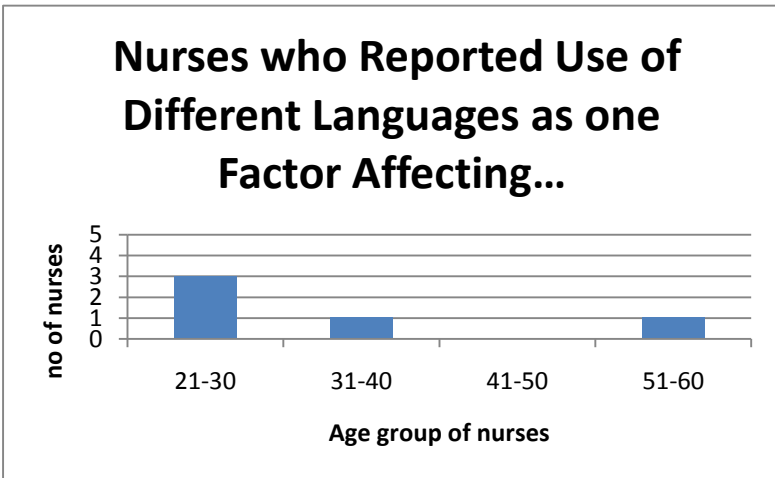


Figure 3: Number of nurses reporting use of different languages as one of the factors affecting communication

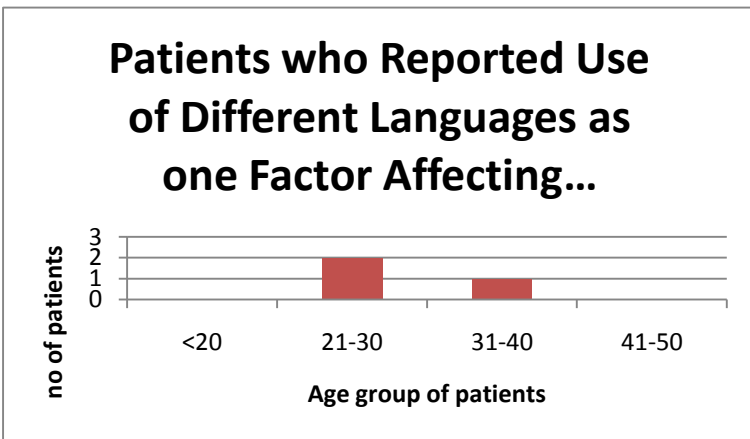
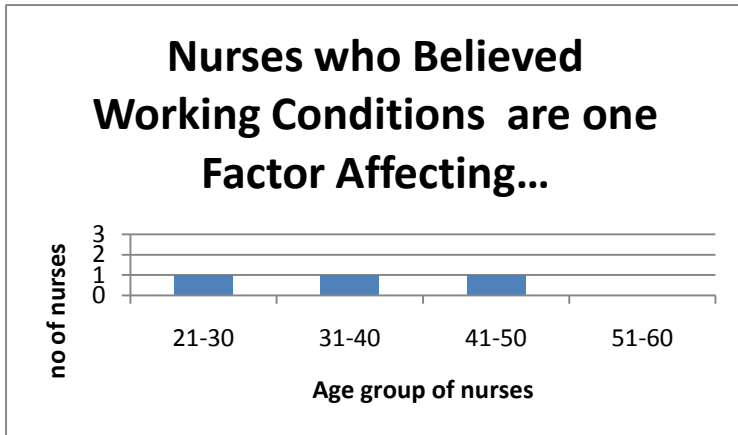
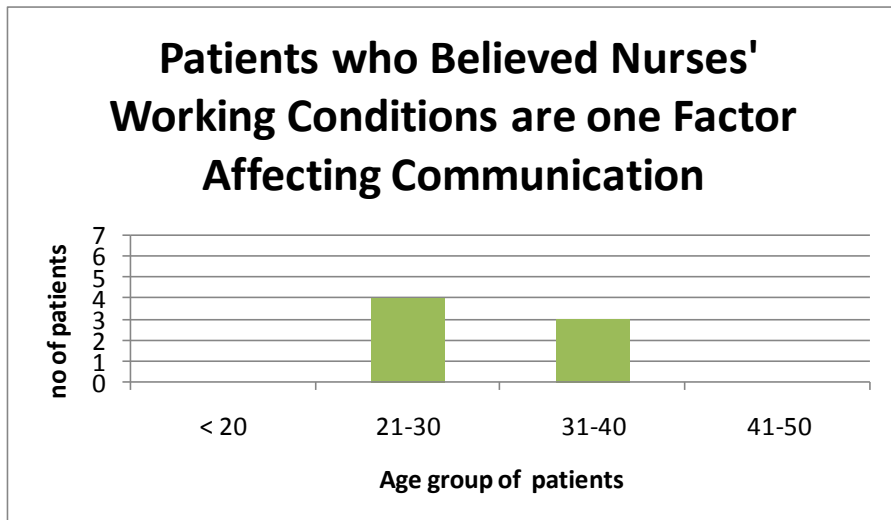


Figure 4: Number of patients reporting use of different languages as one of the factors affecting communication



**Figure 5: Number of nurses reporting that working conditions are one of the factors affecting communication**



**Figure 6: Number of patients reporting that Nurses' working conditions are one of the factors affecting communication**

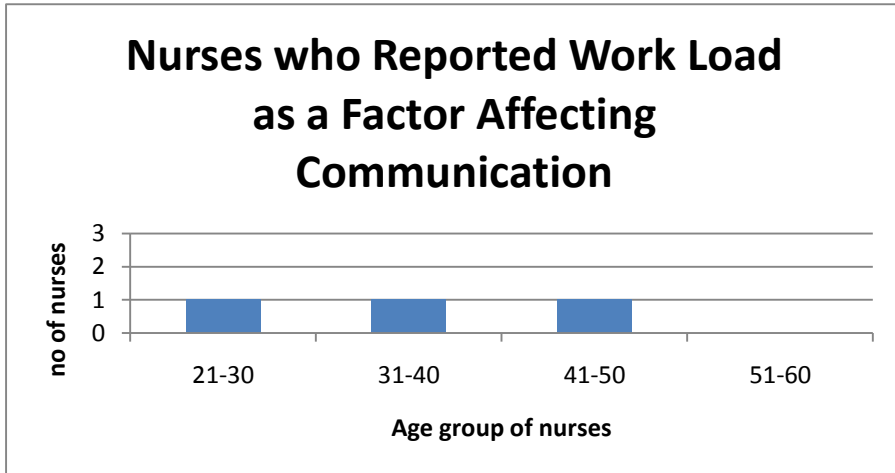


Figure 7: Number of nurses who reported that nurses’ work load is one of the factors affecting communication

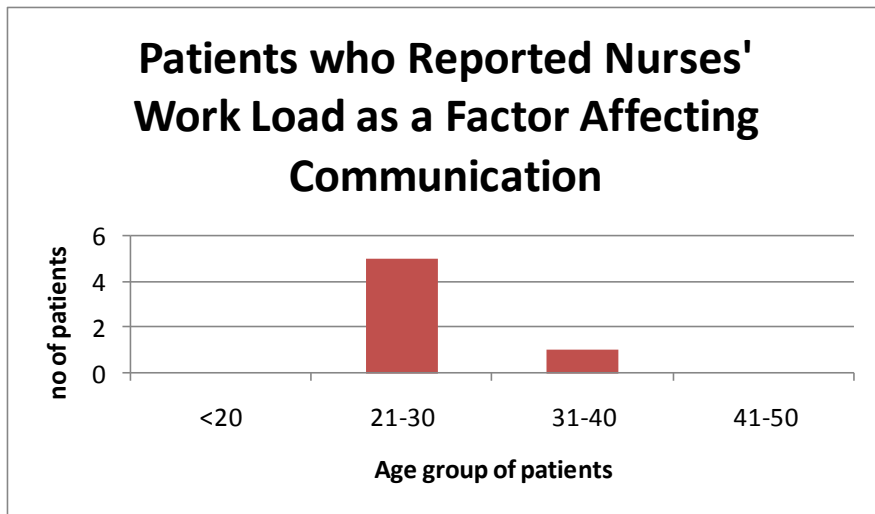


Figure 8: Number of patients who reported that nurses’ work load is one of the factors affecting communication

Collected data showed that all patients were females, while, on the other side, the nursing professionals were both females (86.7%) and males (13.3%) (Table 1). Results further indicated that 21 (70%) women communicated freely and better with male nurses while only 9 (30%) did so with female nurses (Table 2). These findings reveal that communication is affected by the gender distribution of nurses, because the population of male nurses, with whom patients communicate better, is less than that of female nurse.

Age of nurses also affects nurse-patient communication. 66.7% of patients reported to communicate better with nurses aged 41-50 years old, 1 (6.7%) communicated better with nurses aged 21-30, 2 (13.3%) communicated better with nurses aged 31-40 and 2 (13.3%) communicated better with nurses aged 51-60 (Table 4). The largest numbers of patients communicate better with the age group 41-50, yet this age group comprises only 3 out of 15 nurses (20%) (Table 3). Nurse-patient communication is therefore affected by the age distribution of the nurses.

Out of the 15 nurses interviewed, 4 nurses reported lack of time as a factor affecting nurse-patient communication (Figure 1), and out of 30 patients, 15 reported lack of time as one of the factors affecting nurse-patient communication (Figure 2). Use of different languages was another factor affecting communication and it was reported by 5 (33%) nurses (Figure 3) and 3 (10%) patients (Figure 4). Unfavourable working conditions were also among those factors that affect nurse-patient communication, as reported by 20% of the nurses (Figure 5) and 23% of the patients (Figure 6). 20% of the interviewed nurses and patients also mentioned that nurses' work overload affects nurse-patient communication (Figures 7 and 8).

### Conclusion

Results obtained in this study clearly show that multiple factors affect communication between nurses and patients on the maternity unit. These factors include nurse age and gender, lack of time to talk to patients, use of different languages, working conditions and nurses' work load. Impaired nurse-patient communication is a social phenomenon that is indeed a serious and devastating problem, even though for decades it has been behind a veil of denial, secrecy and disbelief to the responsible authorities. Affected nurse-patient communication is a prevailing problem in health care services, particularly in the maternity unit.

It can be concluded that appropriate governmental intervention and legislative protection, together with the assistance and cooperation of professionals such as nurses specialising in communication skills (who are concerned with the well-being of mothers and neonates), can be helpful. The researchers therefore recommend that workshops and trainings be held for nurses, to ensure that all nurses in maternity are fully informed and educated about the purpose and function of proper communication. In addition, it is recommended that the Government of Lesotho, through the Ministry of Health, should review and amend legislations relating to the measures taken to improve nurse-patient communication in maternity units. The community should also be encouraged to participate in trainings and workshops enhancing proper communication skills.

It is also recommended that the psychosocial support services within health institutions in Lesotho should be broadly orientated to the victims of ineffective communication, so that they can get assistance, not desert health institutions, and not feel the need to go for traditional treatment. In addition, the Government of Lesotho should deal with work overload on nurses, especially in Government hospitals, by employing more numbers of nurses. This can be achieved by communicating with nursing schools, so that completing students are put in a work place immediately after completion.

As a result of a lack of written literature pertaining to this topic area in the context of Lesotho, the focus of the literature review in this paper had to be on papers written about western countries. Due to this scarcity of region-specific information about nurse-patient communication, it is therefore suggested that more research should be conducted to add onto the available literature.

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# A REVIEW OF ANTIRETROVIRAL MEDICINES COST IN PRIMARY HEALTH CARE CLINICS IN LESOTHO

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## **Abstract**

HIV/AIDS treatment is costly. Lesotho, as a resource-limited country, depends mostly on donor funding for HIV/AIDS treatment and care. Knowledge of how much was spent on treatment of HIV/AIDS is lacking. This leads to overstocking of some ART medicines resulting in expiry. Sufficient funds need to be secured for the treatment programs. The main objective of the study is to assess the cost of antiretroviral medication treatments, by specifically assessing the cost of antiretroviral regimens, antiretroviral side effects, and the cost of medicines used for prophylaxis and treatment of opportunistic infections as well as the cost of monitoring laboratory tests and dietary supplements.

The study population consisted of 1,424 patients and study period was between 12 and 56 months from January 2004 to August 2008. Retrospective observational method was used. The cost for HIV/AIDS treatment comprised the cost of antiretroviral medicines and those used for their side effects, opportunistic infections (OI) prophylaxis and treatment, dietary supplements as well as monitoring laboratory tests.

The main findings reveal that regimens 1a (stavudine/lamivudine/nevirapine) and 1c (zidovudine/lamivudine/nevirapine) are the least expensive (cost/prevalence index of 0.6 and 0.7 respectively). Regimens containing efavirenz are found to be more expensive than those containing nevirapine (cost/prevalence index of 1.2 and 1.7 respectively). When using *d*-values, there is a significant difference between the cost of regimens 1a and 1b, 1a and 1d, 1c and 1d and the information could be used for regimen switching decisions. Increase in CD4 cell count is more in stavudine-based regimens than in zidovudine-based regimens, which cost less per treatment. Cost effectiveness ratio is lower in 1a with R9.42/1cell/mm<sup>3</sup> of CD4 cell count increase, and the highest was 1d with R31.77/1cell/mm<sup>3</sup> of CD4 cell count increase. Therefore it is concluded that stavudine-based regimens are less costly as they have the lowest cost- effectiveness ratio in the Lesotho clinic environment.

**Key words:** antiretroviral therapy, HIV/AIDS, antiretroviral regimens, prophylaxis, cost/prevalence index, *d*-value and cost-effectiveness ratio

## **Introduction**

For a long time people were dying of HIV/AIDS-related diseases because they had no access to the relatively high cost HAART. Since HAART, along with new HIV treatment guidelines, have been introduced in Lesotho, it has continued to play an important role in the management of HIV/AIDS. It is aimed at reducing viral load and increasing CD4 cell count (Lesotho, 2004). High CD4 cell count makes patients suffer less from opportunistic infections, as most incidences occur in lower CD 4 cell counts (Lesotho, 2007). It also improves the quality of life of patients (Freedberg *et al.*, 2001: 824). Antiretroviral medicines have side effect like any other medicines, and being a life-time treatment this can cause uncertainty for the patients in need of them. However, according to the study conducted at Scott Hospital, side effects and opportunistic infections commonly occur mostly in the first 6 months of treatment (Cleary *et al.*, 2007: 16).



Antiretroviral services are currently offered for free in Lesotho to patients who were seen at Christian Health Association of Lesotho (CHAL) and government clinics, but they are not free from the point of view of the provider. Hence this study assessed the cost of HIV treatment from the perspective of the provider, because the provider pays for drug costs, dietary supplements and monitoring laboratory tests. Although at the private clinic patients still pay for consultation and refill fees, (where patients pay for refilling their prescription during drug pick-up), they do not pay for antiretroviral drugs, as the government of Lesotho pays for them. This study also assessed cost changes seen during regimen switching.

### **Statement of the problem**

Assessing cost of antiretroviral treatment using different ARV regimens provides a basis for proper decisions to be made in the management of HIV disease including drug conservation for future treatment options (Orrell et al., 2007). Decisions made for the selection of regimens should be based on the outcome of treatment emanating from each regimen, adverse effects and toxicities, and finally cost effectiveness of the regimen. There may be patients who may not do well on a certain regimen, and therefore treatment of HIV should be individualized for the minority of patients to achieve benefit. In a resource limited country like Lesotho, treatment of HIV is key for the economy of the country as many people in the workforce are affected and infected. Therefore treatment of HIV should remain affordable for the majority of patients to gain benefit.

### **Objectives**

The main objective of the study is to assess the cost of antiretroviral medication treatments, by specifically assessing the cost of antiretroviral regimens, antiretroviral side effects, and the cost of medicines used for prophylaxis and treatment of opportunistic infections as well as the cost of monitoring laboratory tests and dietary supplements.

### **Methodology**

#### **Study design**

The design of the study was observational retrospective study. Only medical records were examined for collection of the relevant data.

#### **Study sites**

Eight Study sites were chosen because of their vicinity. They were all within the radius of 35 km from Roma. Four public ART clinics, one Christian Health Association of Lesotho (CHAL), and three private clinics were selected.

#### **Study population**

The researcher retrospectively abstracted data from patient files of 1,423 HIV/AIDS patients, who were on antiretroviral treatment for a minimum of one year. All patients who collected their medicines until 31 August, 2008 and who had been on antiretroviral drugs for one year or more were included in the population.

#### **Inclusion criteria**

All patients who had been on antiretroviral therapy for at least one year (12 months) and who had come for refills at least 4 times in a year (those who received three months supply of antiretroviral drugs) or 12 times a year (those

who received monthly antiretroviral drugs supply) were included in the population for the study. HIV/AIDS patients who were on both antiretroviral first line and second line drugs were included. HIV/AIDS patient who also had TB were included in the study. HIV/AIDS patients who transferred into the clinic from another clinic, but who had been on treatment for one year in the clinic were included.

### **Exclusion criteria**

All HIV/AIDS patients who were transferred out of the clinics, HIV/AIDS patients who defaulted during the study, HIV/AIDS patients who died were excluded. HIV/AIDS paediatric patients (0-14 years) were also excluded. Sexually transmitted infections were not considered in the study due to the fact that even though they predispose a patient to HIV/AIDS, they had no direct effect on HIV/AIDS treatment and its cost. Other medical conditions such as hypertension and its treatment that were not related to HIV/AIDS were not included in the data.

### **Data analysis**

Data analysis was carried out using SAS statistical package. Among the formulae used was cost-prevalence index as specified below and others can be found in standard statistics literature.

#### **Cost-prevalence index = percent cost / percent prevalence**

Where the cost-prevalence index would be interpreted as follows:

If cost-prevalence index < 1 then the drug item utilized is relatively inexpensive.

If cost-prevalence index = 1 then there is an equilibrium between the cost and prevalence of the drug item.

If cost-prevalence index > 1 then the drug item utilized is relatively expensive

(Scholtz et al., 2006)

### **Results and discussion**

The main results show the cost of treatment of HIV according to ARV regimens. Significance of the results is established. Cost of ARV regimens is then compared and cost effectiveness analysis is calculated. Incremental cost is also assessed and compared.

## ANTIRETROVIRAL COSTS

**Table 1: Cost contribution of ARVs, for all ART clinics throughout the duration of treatment in Maluti**

| ARV regimens                       | Number of pts/<br>regimen | Mean and<br>Std dev<br>cost | Min cost | Max cost | Median<br>cost | Total cost   | Cost/<br>prevalence<br>index |
|------------------------------------|---------------------------|-----------------------------|----------|----------|----------------|--------------|------------------------------|
| 1a                                 | 527                       | 2253.8<br>±1622.1           | 629.5    | 6530.64  | 1426.52        | 1,187,770.25 | 0.6                          |
| 1b                                 | 437                       | 4621.1<br>±2663.7           | 1561.62  | 11263.16 | 3774.5         | 2,019,410.58 | 1.2                          |
| 1c                                 | 109                       | 2509.9<br>±1148.2           | 1403.56  | 7734.68  | 2070.52        | 273,574.46   | 0.7                          |
| 1d                                 | 89                        | 6315.5<br>±3611.0           | 1995.84  | 16841.36 | 5286.97        | 562,064.93   | 1.7                          |
| 1s                                 | 262                       | 5274.3<br>±4261.5           | 850.84   | 30686.38 | 4304.67        | 1,381,853.41 | 1.4                          |
| Total cost of antiretroviral drugs |                           |                             |          |          |                | 5,424,673.63 |                              |

### Interpretation

Table 1 shows average cost of ARVs in all the clinics for all regimens including patients who switched regimens. The cost-prevalence index is also calculated. The cost/prevalence index included in table 1 reveals that regimens 1a and 1c are inexpensive while regimen 1b and 1d are relatively expensive. 1s indicates a code for all switched regimens, including switching to second line regimens.

**Table 2 Comparison of the effect size or *d*-value of cost of antiretroviral drug regimens**

| Regimen | 1a   | 1b   | 1c   | 1d   | 1s   |
|---------|------|------|------|------|------|
| 1a      |      | 0.89 | 0.16 | 1.12 | 0.71 |
| 1b      | 0.89 |      | 0.79 | 0.47 | 0.15 |
| 1c      | 0.16 | 0.79 |      | 1.05 | 0.65 |
| 1d      | 1.12 | 0.47 | 1.05 |      | 0.24 |
| 1s      | 0.71 | 0.15 | 0.65 | 0.24 |      |

### Interpretation

There are practical difference significances between the cost of regimen 1b and 1a, 1d and 1c, 1d and 1a as their *d*-value is above 0.8. There are also nearly practical differences in regimens 1c and 1b and 1s and 1a. There is no practical significant difference between the cost of other regimens.

## How to use this information

The reason for switching of regimens depends on factors such as toxicity of the regimen and resistance developed by the virus to the specific drug. If the cost is the main reason for switching, the switching of antiretroviral drugs may be made between the regimens with no significant difference between the costs. However, this difference must be known to the personnel in-charge of budgets and procurement in order to stock enough medicines in order to avoid stock-outs and expiry of overstocked medicines. The prescriber makes informed decisions about the cost of regimens while prescribing and switching HIV/AIDS patients' regimens, if this information is made available to them.

**Table 3: Outcome of HIV treatment using CD4 cell count in cells/mm<sup>3</sup>**

| Antiretroviral regimens | Number of patients on regimen | CD4 cell count increase     |                                      |         |        |
|-------------------------|-------------------------------|-----------------------------|--------------------------------------|---------|--------|
|                         |                               | Mean and standard deviation | Number of patients with CD4 increase | Maximum | Median |
| 1a                      | 527                           | 239.2 ±238.1                | 526                                  | 1641.0  | 177.5  |
| 1b                      | 437                           | 226.4±184.2                 | 435                                  | 1179.0  | 191.5  |
| 1c                      | 109                           | 192.1±194.6                 | 109                                  | 847.0   | 184    |
| 1d                      | 89                            | 198.8±169.8                 | 88                                   | 675.0   | 181.5  |
| 1s                      | 262                           | 275.0±239.2                 | 259                                  | 1106.0  | 231.0  |

## Interpretation

For regimen 1a to increase CD4 cell count by 1 cell/mm<sup>3</sup>, R9.42 is spent, while for regimen 1b to increase CD4 cell count by 1 cell mm<sup>3</sup>, a total amount of R20.41 is spent. Incremental cost-effectiveness is R184.96 meaning that to get additional CD4 cell increase of 1cell/mm<sup>3</sup>, this is the amount of money that is supposed to be spent this would enable the patient to receive additional benefit of 1 cell/mm<sup>3</sup>.

**Table 4 Cost effectiveness analysis**

| Antiretroviral regimens | Cost-effectiveness ratio                                   |
|-------------------------|--|
| 1a                      | R 2253.80/ 239.2 = <b>R9.42 /1cell per mm<sup>3</sup></b>  |
| 1b                      | R 4621.1/ 226.4 = <b>R20.41 /1cell per mm<sup>3</sup></b>  |
| 1c                      | R 2509.90/ 192.1 = <b>R13.07 /1cell per mm<sup>3</sup></b> |
| 1d                      | R 6315.50/ 198.8 = <b>R31.77 /1cell per mm<sup>3</sup></b> |

## Interpretation

Incremental cost-effectiveness ratio is high between regimens 1c and 1d and low between 1a and 1c. The information can be used when deciding on which regimens to switch to as less money is needed to gain the same benefit in CD4 cell count increase, as opposed to a more expensive regimen with the same benefit in terms of CD4 cell count increase.

**Table 5 Incremental cost effectiveness ratio**

| Regimens  | Incremental cost-effectiveness ratio   | Interpretation   |
|-----------|--|--|
| 1a and 1c | $\frac{R\ 2509.90 - R\ 2253.80}{192.1 - 239.2} = \frac{R256.10}{(-)60.16} = \mathbf{R4.26/1cell\ per\ mm^3}$ | Incremental cost-effectiveness is <b>R4.26</b> this means that to get additional benefit of CD4 cell increase of 1cell/mm <sup>3</sup> , the amount of R4.26 is supposed to be spent     |
| 1b and 1d | $\frac{R\ 6315.50 - 4621.1}{198.8 - 226.4} = \frac{R1694.40}{(-)27.6} = \mathbf{R61.39/1cell\ per\ mm^3}$    | Incremental cost-effectiveness is <b>M 61.39</b> this means that to get additional benefit of CD4 cell increase of 1cell/mm <sup>3</sup> , the amount of M61.39 is supposed to be spent. |
| 1c and 1d | $\frac{R\ 6315.50 - R\ 2509.90}{198.8 - 192.1} = \frac{R\ 3805.6}{6.7} = \mathbf{R568.00/1cell\ per\ mm^3}$  | Incremental cost-effectiveness is <b>R 568.00</b> . Therefore, to get additional CD4 cell increase of 1cell/mm <sup>3</sup> , Lesotho is supposed to spend this amount.                  |
| 1a and 1d | $\frac{R\ 6315.50 - R2253.80}{236.2 - 192.1} = \frac{R\ 4061.70}{44.1} = \mathbf{R\ 92.10/1cell\ per\ mm^3}$ | Incremental cost-effectiveness was R 92.10. This figure shows that to get additional CD4 cell increase of 1cell/mm <sup>3</sup> , would be <b>R92.10</b> .                               |

Assessment of cost-effectiveness of antiretroviral regimens used in the treatment of HIV/AIDS shows that stavudine-based regimens cost less than zidovudine based. A higher CD4 cell count increase is a response for antiretroviral treatment. The stavudine-based regimen is given to the majority of patients and results in cost saving, but a high benefit for HIV/AIDS patients. This information may be used for the decision to continue use of stavudine in Lesotho. The cost of drugs may be a deciding factor for the CD4 cell increase and for the cost-effectiveness ratio. Zidovudine-based regimens especially one with Nevirapine, also have a lower cost effectiveness ratio. Cost-effectiveness ratios for both stavudine and zidovudine-based regimens with efavirenz as well as the cost/prevalence index, and  $d$  value are higher than those with nevirapine. This information may be used in major public health decisions on antiretroviral regimens that the country decides to use, bearing in mind that Lesotho has the third highest HIV/AIDS prevalence in world and is one of the least developed countries. It depends heavily on foreign assistance, especially for HIV/AIDS management.

### Conclusion

The important conclusions related to the cost of antiretroviral regimens and associated cost are that first line regimens containing stavudine are relatively less expensive than those containing zidovudine. CD4 cell count increase is higher with the former type of treatment. The same can be said about first line antiretroviral combinations containing Nevirapine. They are less expensive than those containing efavirenz. The former increase CD4 cell count more.

### Recommendation

During the time of study tenofovir was not commonly used therefore another study is recommended to assess the cost of its use.

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