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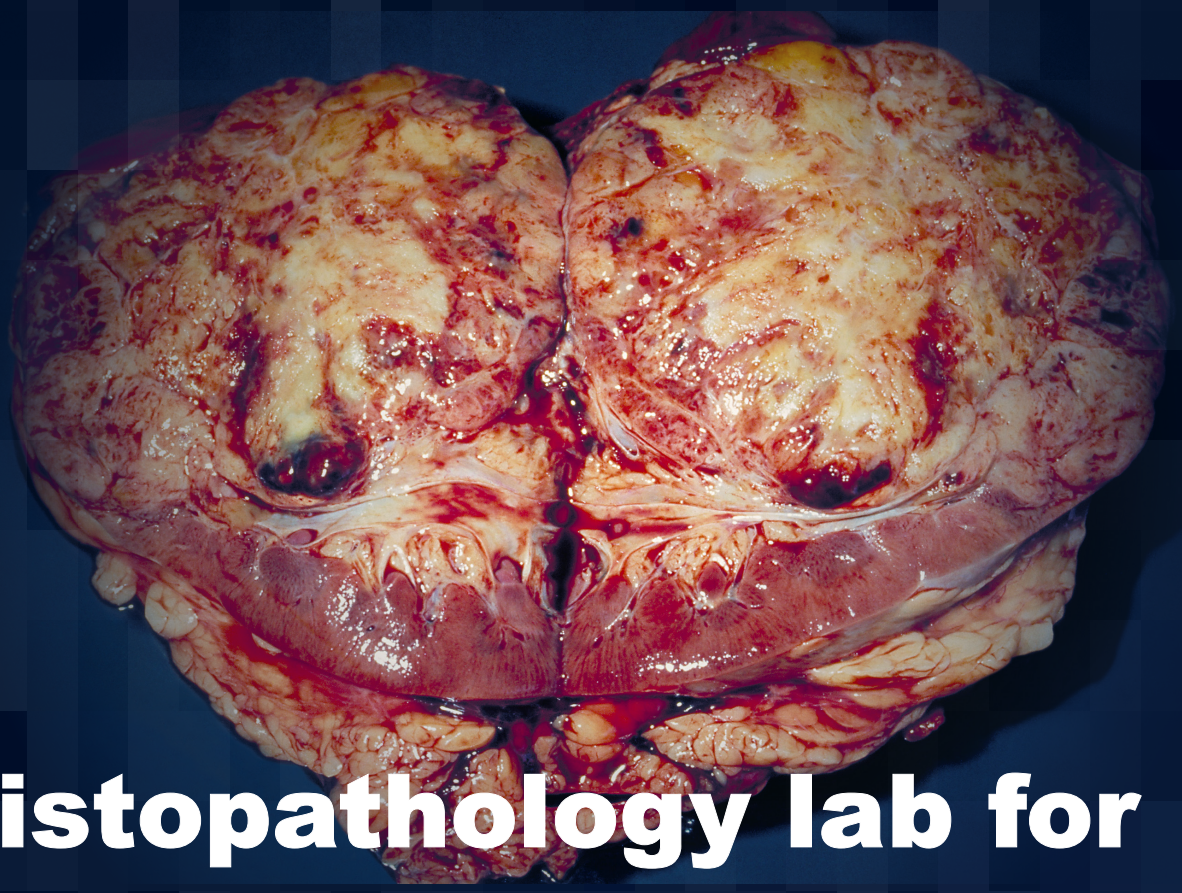

Histopathology lab for cancer diagnosis in South Sudan

- Orofacial tumours and tumour-like lesions
- Typhoid ileal perforation in children
- KAP of PMTCT among pregnant women
- Burnout syndrome among healthcare workers
- Regulatory challenges in a complex emergency
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EDITORIAL

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BACK COVER

FRONT COVER IMAGE:

Gross pathologic changes in a bisected kidney tissue specimen, in a case of a large, renal cell carcinoma (RCC). Much of the kidney had been replaced by gray and yellow tumor tissue. A little remaining renal cortex, along with some pericapsular fat, were still visible at the bottom of this surgical specimen. (Credit: CDC/ Dr. Edwin P. Ewing, Jr.)

South Sudan must establish a histopathology laboratory

Histopathology is an important branch in laboratory medicine and vital in the management of patients with conditions ranging from tumours, infections, metabolic conditions, and congenital anomalies.

In South Sudan, a histopathology service is emerging. It started in 2012 by sending paraffin tissue blocks to neighbouring countries for processing. Through the efforts of two consultants in Juba this service has been extended across the country by involving the teaching and state hospitals. By this editorial I aim to enlighten clinicians and patients about the importance of histopathology services in diagnosis and management of diseases, and to encourage the government to establish a national histopathology laboratory.

Histopathology services enable the following:

- Typing of tumours (**benign vs. malignant /cancer, and carcinoma vs. sarcomas**). This has important implications for the management and treatment of patients and their prognosis. It is also possible to tell whether a tumour is primary or secondary. This information is required by clinicians before and after surgery.
- Grading of tumours (**low grade vs. high grade, or well differentiated vs. moderately differentiated vs. poorly differentiated / anaplastic**). Again, this guides the treatment with prognostic significance.
- Histological staging of tumours aids the refinement of clinical staging. This determines the type and extent of treatment to be offered and also carries prognostic significance.
- Establishment of a national tissue bank (**cancer and other diseases**) consisting of formalin fixed and paraffin embedded tissue blocks will be in place for future reference and research. This will be of great use to local researchers and those from the other countries. Findings from these researches may be important in planning and policy formulation for the country.
- Screening for some common cancers (e.g. of the cervix, breast, thyroid and prostate) ensuring early detection and improving prognosis.
- Complete autopsies (post-mortems) will be assured as the gross findings will be married with the histopathological findings from tissues sampled. The precision of the causes of death will be improved. This information is vital in setting up a national "cause of mortality" register. It is also important in planning and formulation of policies (related to some diseases) for the country.
- Improved teaching of pathology to medical cadres at all levels. The students will be able to correlate the gross and histopathological appearance of different diseases and therefore come up with a better understanding of disease mechanisms. This will improve the quality of training.
- A national cancer registry with more precise information will be readily available. This information will be paramount in planning and policy making with regards to cancers and their treatment.

Importantly, the setting up of a modern histopathology and cytology department, together with a national Cancer Registry centre at the national level, will have a significant diagnostic and service management value.

HISTOLOGICAL STAGING OF TUMOURS AIDS THE REFINEMENT OF CLINICAL STAGING

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Orofacial tumours and tumour-like lesions in children treated at Muhimbili National Hospital, Tanzania

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Introduction: Orofacial tumours and tumour-like lesions occur at any age. An increasing occurrence has made these tumours a significant cause of morbidity and mortality in children.

Objective: To determine the clinicopathological characteristics and treatment modalities of orofacial tumours and tumour-like lesions in children at Muhimbili National Hospital.

Methods: Children aged below 18 years with orofacial tumours and tumour-like lesions were interviewed using a structured questionnaire and clinically examined. The data were analysed using statistical package for social sciences (SPSS) version 20.0. Statistical significance was considered at a p-value of < 0.05.

Results: 121 children aged 4 days to 17 years (mean= 8.56 years ±5.5 SD), 52.1 % being male, participated in the study. The age groups 0-5 years (38%) and 11-15 years (28.1%) were most affected- p-value 0.38. The majority (86%) of the lesions were benign; haemangioma was the most (16.4%) common benign tumour. Dentigerous cyst was the most (7.8%) frequent tumour-like lesion observed, while Burkitt's lymphoma and squamous cell carcinoma were the most common malignant lesions. Swelling was the most common clinical feature in all tumours and tumour-like lesions and surgery was the most common treatment.

Conclusion: Benign orofacial tumours and tumour-like lesions were the types most commonly seen among children in Tanzania.

Key words: orofacial, tumours, tumour-like lesions, children, Tanzania.

INTRODUCTION

Orofacial tumours and tumour-like lesions occur at any age. An increasing occurrence has made these tumours a significant cause of morbidity and mortality in children. [1] The spectrum of diseases differs from that in adults as does the behaviour of certain lesions. [2] Some lesions change with development of the body and therefore their management changes as well. [3] Various reports have discussed the frequency, clinical presentation, histopathological characteristics and management of orofacial tumours and tumour-like lesions in children. Making comparisons between published series is difficult because of the differing descriptive criteria. [3, 4] In East Africa, and in Tanzania particularly, [5] reports are limited so this study aimed at addressing this shortfall in our knowledge.

The objective of the study is to determine the clinicopathological characteristics and treatment modalities of orofacial tumours and tumour-like lesions in Tanzanian children.

METHOD

The study was conducted at the Departments of Oral and Maxillofacial Surgery and Otorhinolaryngology (ORL) of Muhimbili National Hospital (MNH) Dar es Salaam, which receives patients from all over Tanzania.

Patients less than 18 years old with orofacial tumours and tumour-like lesions who attended MNH from September 2016 to March 2017 were studied. Clinical diagnoses were confirmed histologically. The lesions were classified as benign tumours, malignant tumours or tumour-like lesions. Those with no histological diagnosis or with

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Table 1. Distribution of benign orofacial tumours by age and sex among children treated at MNH

Histological type	Age Group Years								Total
	0 - 5		6 - 10		11- 15		16 - <18		n (%)
	M	F	M	F	M	F	M	F	
Ameloblastic Fibroma	1	-	-	-	-	-	-	-	1 (1.5)
Ameloblastoma	-	-	-	-	2	-	-	1	3 (4.6)
Cystic Hygroma	1	1	-	-	-	-	-	-	2 (3.0)
Desmoplastic fibroma	-	-	-	-	1	-	-	-	1 (1.5)
Fibromatosis	-	-	1	-	-	-	-	-	1(1.5)
Fibroma	1	1	-	-	-	2	-	1	5 (7.6)
Haemangioma	1	7	-	2	1	3	1	2	17 (25.7)
Giant cell tumour	-	-	-	-	-	-	1	-	1 (1.5)
Lipoma	-	1	-	-	-	-	-	-	1 (1.5)
Lymphangioma	3	9	2	-	-	-	-	-	14 (21.3)
Neuroectodermal tumour of infancy	1	2	-	-	-	-	-	-	3 (4.6)
Neurofibroma	-	-	1	-	1	2	-	-	4 (6.0)
Odontoma	-	-	2	-	-	-	-	-	2 (3.0)
Ossifying Fibroma	1	-	2	-	4	2	1	-	10 (15.2)
Schwannoma	-	1	-	-	-	-	-	-	1(1.5)
Total by sex	9	22	8	2	9	9	3	4	
Total n (%)	31(47)		10(15.1)		18(27.3)		7(10.7)		66 (100)

inconclusive results and terminally ill children were excluded. Statistical package (SPSS) version 20.0. (SSPS Inc. Chicago IL, USA) was used in the analysis.

Ethical approval was obtained from the Research and Publications Committee of the Muhimbili University of Health and Allied Sciences.

RESULTS

Demographic characteristics

A total of 121(63 males, 58 females) children with orofacial tumours and tumour-like lesions, age ranging from 4 days to 17 years (mean= 8.6 years ± 5.5 SD) were treated in the hospital during the study period. The age group 0-5 years was the most affected (38%) followed by the 11-15 years age group (28.1%) p-value 0.38.

Frequency of orofacial tumours and tumour-like lesions

Of the 38 histological types of lesions detected 86% were benign lesions. Haemangioma was the most frequent benign tumour (25.7%), followed by lymphangioma (21.6%) (Table 1). Fibrous dysplasia was the most frequent (23.7%) tumour-like lesion followed by dentigerous cyst (21%). The most frequently observed malignant tumours (14%)were Burkitt's lymphoma (BL) and squamous cell carcinoma (SCC) each affecting 23.5% participants.

Clinical presentation

The mean duration of the lesions at presentation in the hospital was three months (range less than a month to 15 years). The maxilla was the commonest (30%) site for the benign orofacial tumours, followed by the submandibular region (26.9%). About 47% of malignant tumours were located in the mandible, the other common sites included the gingivae (41.1%), submandibular region (41.1%), and the cheek (23.5%). 34% of the tumour-like lesions were located in the mandible. Itching was the commonest symptom (13.2%), followed by pain (8.6%) and paraesthesia (7.7%). Toothache was reported by 6.7% and 5.8% had fever. In malignant tumours, pain and fever were the most (47%) frequent symptoms. All the patients presented with swellings. In benign lesions, discoloration of the skin or mucosa was encountered in 26%, difficult mouth opening in 10.6%, displaced teeth in 8.6% and ulceration in 6.7%. Malignant lesions also

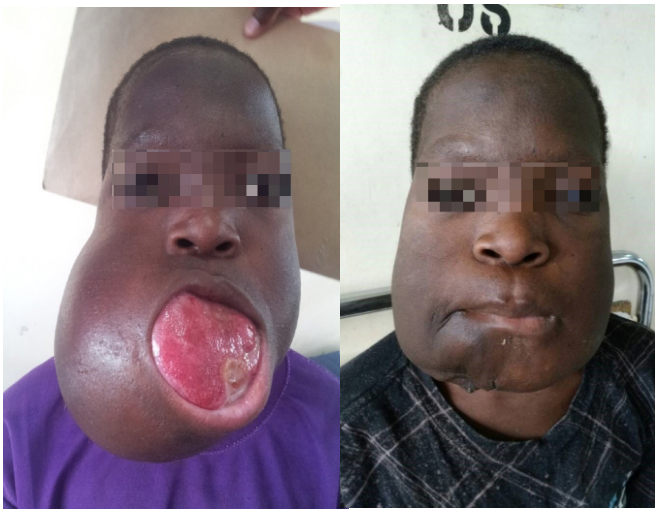

Figure 1. Photograph of a 14 years old male with central giant cell granuloma of the mandible before and two weeks after tumour enucleation and curettage (Photos by Dr Natana 2017 – patient gave permission).

presented with ulceration in 64.7% participants, bleeding in 47%, difficult mouth opening in 41.1% and loose teeth in 41.1%. Benign lesions tend to be about 6 – 10 cm in diameter while malignant ones were larger at about 15 cm.

Treatment

Surgical en bloc excision or enucleation was carried out for 53% of benign tumours (p-value 0.001). Radical surgical resection was used in the 6% who had ameloblastomas; 20 patients (30.3%) were referred abroad. Sclerosing agents were used in 6% who had vascular lesions and observation in the 4.5% with fibrous dysplasia and ranula. Surgical curettage, remodelling and enucleation were the commonest methods used for tumour-like lesions. Wide surgical excision was the commonest treatment applied in 76.4% participants with malignant lesions with chemotherapy in 47% and radiotherapy in 17.6% as adjunctive therapies following surgery.

DISCUSSION

Children constituted 23.4% of all the patients with orofacial tumours and tumour-like lesions who were treated at MNH, consistent with other African studies. [5] with males more frequently affected than females as seen in Kenya. [6] However, the opposite has been reported in other studies. [7] Although the lesions were more frequent in 0 – 5 and 11 – 15 year olds, other reports are at variance with this finding. [8]

Benign lesions were more common compared to malignant lesions as reported in other studies [1]. There may be several reasons for this including changes in management approaches, time of year of this study and even a change of occurrence. However, a previous study at MNH had indicated predominance of malignant tumours [1]. A predominance of haemangioma and lymphangioma in the study is probably because MNH is the main referral centre for vascular tumours in Tanzania. Developmental cysts were the most common tumour-like lesions as found elsewhere. [9]

Burkitt's lymphoma and squamous cell carcinoma (SCC) in children aged 0-10 years are rare in other continents [10]; however, while SCC was thought to be primarily a disease affecting elderly males [11], it was found across all age groups. The known risk factors for SCC in adults which include smoking, high consumption of alcohol, chewing of betel and chronic irritation are not relevant in children. Therefore, a genetic predisposition, viral infections and immunosuppression have been postulated as likely risk factors. [12]

As in other studies [13] all presented with swelling in the orofacial region. Other presentations included eye problems such as epiphora, proptosis and diplopia in malignant tumours indicating the infiltrative nature of the tumours. Benign and malignant lesions share some presenting features, therefore clinicians must have a high diagnostic index for suspected nodules on the oral mucosa to avoid delayed management. [13]

Surgery was the mainstay of treatment [2] (Figure 1). Ameloblastoma tumours were huge requiring aggressive surgery, although reconstruction to preserve the shape and function of the jaws were not offered generally. A previous study on the postoperative quality of life of adult patients with ameloblastoma in Tanzania concluded that the patients were invariably affected by lack of reconstructive surgery[14]. Some of our patients with vascular tumours were referred to India.

Wide surgical excision with curative intent was used for malignant tumours. The histological type, grade and stage of the tumour in addition to the subsequent report of the status of the margins determined the need of a patient for postoperative adjuvant therapy. All participants with malignant salivary gland tumours and three who had SCC underwent wide surgical excision as a sole treatment with a disease-free margin that obviated the use of radiotherapy. Radiotherapy has been reported before to impair growth of facial structures and increase the risk of second malignancy in children. [15]

CONCLUSIONS

Benign orofacial tumours and tumour-like lesions were the types most commonly seen in children in Tanzania. However, the overlap of clinical presentations means that clinicians must be alert to the fact that some lesions clinically thought to be benign might be malignant. There is a need to raise public awareness about these lesions to improve early reporting.

Conflict of interest: None

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Typhoid ileal perforation in children: does clinical diagnosis alone justify laparotomy?

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Introduction: Typhoid ileal perforation is one of the most common surgical complications of typhoid fever, with high morbidity and mortality in resource poor tropical areas in Africa and other developing countries.

Objective: The aim of this study was to evaluate clinical diagnosis of typhoid ileal perforation as justification for laparotomy.

Method: A retrospective study from January 2008 to December 2011 in the Paediatric Surgery Division of the University of Abuja Teaching Hospital.

Results: The age group most commonly affected was aged 6-9 years (43.5%); there were 20 (43.5%) males and 26 (56.5%) females. The commonest clinical features were fever, vomiting, abdominal pain, tenderness and distension (52.3%). Thirty one (67.4%) of the patients did not have any diagnostic radiological investigations. Fifteen (32.6%) patients had superficial wound infection, ten (21.7%) died, eleven (23.9%) had no complications.

Conclusion: We advocate that under circumstances where urgent diagnostic radiological and laboratory investigations are not available promptly, clinical diagnosis of typhoid ileal perforation, especially signs of peritonitis should justify an emergency laparotomy.

Key words: typhoid, ileal perforation, peritonitis, laparotomy

INTRODUCTION

Typhoid fever (Enteric fever) is caused by *Salmonella typhi* which is transmitted faeco-orally. It presents with fever, chills, headache, abdominal pain and tenderness. It is a public health problem which becomes a surgical emergency if medical treatment fails.

A common surgical complication is distal ileal perforation. Most of the perforations occur in the Peyers patches which are organized lymphoid nodules; they contain B and T-lymphocytes.[1] Through cell mediated hypersensitivity, the lymphoid nodules become necrosed, perforation of the bowel wall follows with contamination of the peritoneal cavity. A cascade of inflammatory reactions ensue and septic peritonitis. Typhoid perforation has a reported incidence of about 20% in adults and 10.3% in children.[1, 2] Surgery is the main stay of treatment of these patients after adequate resuscitation.

The outcome of the management of typhoid perforation has been disappointing with high rates of morbidity and mortality especially in children.[2, 3, 4] Many factors contribute to the high mortality and include delayed presentation and surgical intervention, the ongoing severe peritonitis, septicaemia, fluid and electrolyte derangement and malnutrition.[5]

The diagnosis of typhoid perforation is made from clinical features, while radiologic investigations – erect and supine or lateral decubitus abdominal x-rays – help to confirm the diagnosis by the presence of air under the diaphragm or free intra-peritoneal air. The period of this study was fraught with prolonged and incessant power outages and as such radiological investigations were not readily done. Delayed investigations and hence surgical intervention being major causes of the high mortality it was clear to our team that we needed to answer the question "Does clinical diagnosis alone of typhoid ileal perforation justify laparotomy?"

METHOD

This was a retrospective study in the Paediatric Surgery Division of University of Abuja Teaching Hospital Gwagwalada, Abuja. Ethical clearance was obtained from the Human Research and Ethics Committee of the institution.

The data of the patients from January 2008 to December 2011 were retrieved from the medical record department

Citation: Olori et al, Typhoid ileal perforation in children: does clinical diagnosis alone justify laparotomy?, South Sudan Medical Journal 2019; 12(1):9-11

and operating theatre register. The data studied were patient's age and sex, presenting clinical features, investigations done, time of presentation to surgical intervention, type of procedure and postoperative complications. The data were analyzed for outcome of treatment using IBM SPSS version 14 for Windows.

We excluded all case notes with poor documentation of information needed and case notes of patients whose intra operative findings showed no ileal perforation.

RESULTS

There were 52 operations for diagnosis of typhoid perforation. Six cases (one which had ruptured appendicitis) were excluded following findings different from typhoid perforation. Forty-six patients had typhoid ileal perforation. The commonest age group affected was 6-9 years (43.5%). There were 7 (15.2%) aged 2-5 years, 16 (34.8%) aged 10-13 years and 3 (6.5%) aged 14 years and above. Twenty (43.5%) were males and 26 (56.5%) were females.

Table 1 shows the clinical features as distributed in the various groups.

Thirty-one (61.4%) patients did not have any radiological investigations before surgery, twelve (26.1%) had an abdominal x-ray and one had a chest x-ray (Table 2) of which only five showed air under the diaphragm, one ground glass appearance and six multiple air-fluid levels (Figure 1).

Only three patients were investigated bacteriologically; blood, urine and stool cultures each yielded *Klebsiella*, no growth, E coli respectively (none yielded *Salmonella typhi*). Six patients were operated upon within six hours of presentation, while 38 went to surgery over the next 18 hours (Table 3). Complications (Table 4) were superficial surgical site infection 15 (32.6%), intra- abdominal abscesses 3 (6.5%), re-perforation 1 (2.2%), and mortality 10 (21.7%).

DISCUSSION

There was a 11.5% negative laparotomy rate for typhoid perforation, a finding higher than 4.8% of that recorded by Agbakwuro et al.[6]

The male to female ratio in our study was 1:1.3. This is in contrast to studies done in other parts of Nigeria and Africa which recorded ratios of 1.9:1, 2.6:1 and 1.4:1 by Ugwu et al, Chalya et al and Osifo respectively.[7, 8, 9]

All the patients had fever, vomiting, abdominal pains and clinical features of peritonitis which is in keeping with previous reports.[7] In addition, 52.2% of the patients had abdominal distension. These clinical features were taken as indices of perforation.

In our study, apart from measurements of packed cell

Table 1. Clinical features of ileal perforation reported

Clinical features	n (%)
Fever+ vomiting + abdominal pain	1(2.2)
Fever + vomiting + abdominal pain and tenderness.	7(15.2)
Fever+ vomiting +abdominal pain + tenderness + abdominal distension	24(52.2)
Fever+ vomiting	32(61.5)
Abdominal pain+ tenderness +swelling +constipation	14(30.4)

Table 2. Distribution of investigation done by patients with typhoid perforation

Investigations	n (%)
Chest x-ray	1(2.2)
None	31(67.4)
Urine culture	1(2.2)
blood culture	1(2.2)
Abdominal x-ray	12(26.1)

Table 3. Waiting time before surgery

Waiting time - hours	No of cases
12-1	6
13-18	22
19-24	16
30-25	5
>30	3

Table 4. Complications of typhoid perforation surgery

Complications	n (%)
Superficial wound infection	15(32.6)
Deep wound infection	1(2.2)
Intra-abdominal abscess	3(6.5)
Re-perforation	2(4.3)
Septicaemia	1(2.2)
Death	10(21.7)
None	11(23.9)
Superficial wound infection+ re-perforation	1(2.2)
Missing data	2(4.3)

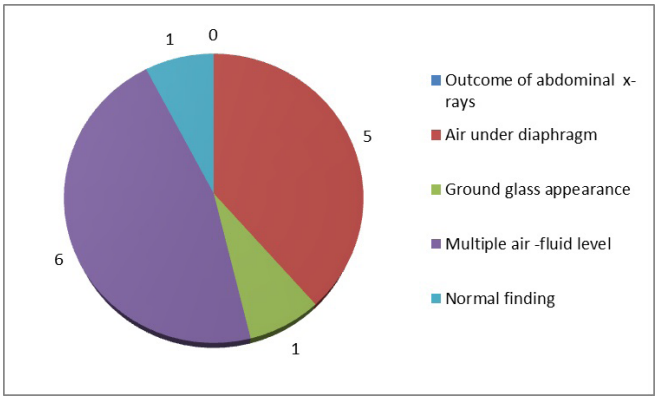

Figure 1. Outcome abdominal x-rays

volume, electrolytes, urea and creatinine, and availability of blood, 31(67.4%) patients did not have any diagnostic radiological investigations prior to surgery. A finding of pneumoperitoneum on plain erect abdominal radiograph confirms intestinal perforation and hence should be done wherever possible. One patient did have a chest x-ray which showed no sub-diaphragmatic air but among twelve who had abdominal x-rays five (41.6% of the 12) showed air under the diaphragm and six showed multiple air/fluid levels on the erect films. This was in contrast to the findings of Chalya et al with 74.7% pneumoperitoneum. [8] The conclusion is therefore that a clinical diagnosis of peritonitis is a sufficient indication for an emergency exploratory laparotomy half of the cases being operated upon based on clinical diagnosis alone. Only 9.6% at laparotomy were negative for typhoid perforation. In one study where both x-rays and abdominal ultrasound scan were done for more than 60% of patients, the authors still recommended that clinical diagnosis and early surgical intervention were keys to good outcomes.[11]

We recorded a mortality of 21.7% which is lower than 28.3%, 39.6%, 28% and 75% in previous studies by Ali et al [5], Van Basten et al [12] and Osifo and Ogiemwonyi [9] respectively. Although lower figures have been reported at 13.09% by Ugwu et al [7] and 16.2% by Agbakwuru.[6] Eleven (23.9%) of the patients did not develop any form of postoperative complication.

Our relatively low mortality rate was believed to be due to the early surgical intervention based on clinical diagnosis and adequate resuscitation before surgery. The majority of our patients were operated upon within the first 18 hours of presentation. Most time spent was on resuscitation of the patients and waiting for theatre space. In situations where radiological investigations are easily accessible the waiting time can be used to do those investigations.

CONCLUSIONS

In view of the high morbidity and mortality of cases of typhoid ileal perforation due to delayed intervention and the relatively low negative laparotomy rate we recorded, we advocate that where urgent radiologic investigations are not available diagnosis of perforation based on clinical features, and especially with a finding of peritonitis, should justify an emergency laparotomy. However adequate resuscitation with fluid replacement pre-operatively is crucial.

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Prevention of mother-to-child transmission of HIV: knowledge, attitudes and practice among pregnant women at Juba Teaching Hospital

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Introduction: Mother-to-child transmission (MTCT) of the human immunodeficiency virus (HIV) accounts for 90% of infancy and childhood HIV infections; hence prevention has a big impact in controlling the spread of HIV within this group.

Objectives: To assess knowledge, attitude and practice of prevention of MTCT of HIV among pregnant women attending antenatal care at Juba Teaching Hospital, South Sudan.

Method: A hospital-based cross-sectional study was conducted during November and December 2015. Data were collected using a structured questionnaire; frequency distribution and two-way tables were used to present and summarize the data. A p-value of <0.05 was considered as indicating statistical significance.

Results: Two hundred and fifty-one pregnant women consented to participate in the study and were enrolled and interviewed at the Maternal and Child Health Clinic (MCHC) in Juba Teaching Hospital. The mean age of the mothers was 25.67 years (range 15 – 41 years), with the standard deviation of ±5.52 years. The majority (88%) were married, 39.1% had no formal education, and 53.4% were unemployed. One-third (30.7%) of the participants had sufficient knowledge on when to start prophylaxis of MTCT (PMTCT). Half of the pregnant women (51%) showed positive attitudes toward PMTCT measures. Two hundred and thirty-one pregnant women (92%) had received counselling for HIV, with 78.4% of them reported being tested for HIV.

Conclusion: The pregnant women's knowledge on HIV/AIDS, specific knowledge on MTCT, MTCT risk factors during breastfeeding, and PMTCT were found to be moderate. Half of the participants showed positive attitude towards PMTCT services utilization.

Key words: HIV, PMTCT, South Sudan

INTRODUCTION

The human immunodeficiency virus (HIV) disease presents a major public health challenge worldwide. The global HIV/AIDS epidemic report of 2013 [1] showed that around 35.3 million people were living with HIV (PLWHIV), of whom about 25 million (almost 70%) were in sub-Saharan Africa and of which 58% were women. It was estimated in 2012, that 3.3 million children aged less than 15 years were living with HIV worldwide. [1]

Use of highly active antiretroviral therapy drugs (HAART) is more effective in preventing early MTCT of HIV than single drug therapy like nevirapine. With no intervention, the risk of MTCT is up to 45% among exposed children. However, with effective specific interventions, the risk can be reduced to less than 2% in children who are not breastfeeding and less than 5% in breastfeeding infants. [2]

Breastfeeding accounts for almost a half of HIV infection among children in Africa. Risk factors that increase vertical transmission include failure to disclose HIV status, mixed infant feeding, prolonged rupture of membranes, maternal high viral load and low CD4 count. [3]

The current WHO policy on reduction of MTCT of HIV, recommends pregnant mothers diagnosed HIV

Citation: Thidor and August, Prevention of mother-to-child transmission of HIV: knowledge, attitudes and practice among pregnant women at Juba Teaching Hospital, South Sudan Medical Journal 2019; 12(1):12-16

positive start on ART, irrespective of their CD4 count and continue for life (called Option B+). Infants born to HIV positive mothers should receive nevirapine or AZT prophylaxis daily until the age of 4-6 weeks irrespective of their feeding methods. [4]

METHOD

This was a hospital-based cross-sectional study of pregnant women attending the MCHC at Juba Teaching Hospital. A total of 251 mothers who met the criteria gave their consent and were interviewed during November and December 2015. Using a 6-part structured questionnaire which included assessment of the mothers' knowledge of HIV and attitude towards PMTCT of HIV, and the services they had received. Using Bloom's cut off points of knowledge [5] the scores were as follows:

- 20 – 26 points = good knowledge
- 15 – 19 points = moderate knowledge
- 0 – 14 points = poor knowledge

Attitude was assessed by showing the respondents eight statements (e.g. "It is important that every pregnant woman gets tested for HIV") and then asking them to indicate the extent to which they agreed with them. Their responses were scored using the Likert's scale [6] as follows:

- strongly agree = 5
- agree = 4
- no opinion = 3
- disagree = 2
- strongly disagree = 1

Data were analysed using software of Statistical Package for Social Sciences (SPSS) version 20. Univariate analysis was done for frequency computation and bivariate analysis used to compute associations between variables; a P value of<0.05 was considered to be statistically significant.

Ethical clearance approval was obtained from the Ethical Board, Ministry of Health, and Republic of South Sudan.

RESULTS

Table 1 shows the mothers' age ranges, marital status, education and occupation. The mean age was 25.7 years (SD±5.52) (range 15 – 41 years). The majority was married, a third had reached or completed secondary education and about half were employed.

Table 2 shows that the age, level of education and occupation were significantly associated with knowledge level. Women older than 20 years, those with primary education and above and employed women had a good knowledge on PMTCT of HIV.

Table 1. Socio-demographic characteristics of the mothers (n=251)

Characteristic	n (%)
Age group (years)	
Less than 20	53 (21.1)
21 to 25	71 (28.3)
26 to 30	88 (35.1)
31 and above	39 (15.5)
Marital status	
Married	221 (88.0)
*Not married	30 (12.0)
Education level	
Non-formal	99 (39.4)
Primary school	68 (27.1)
Secondary and above	84 (33.5)
Occupation	
Housewife	134 (53.4)
Employed	117 (46.6)

** Not married includes single and divorced women, and widows.*

Table 3 below shows that education has a significant association with pregnant women's attitudes towards PMTCT. Participants with college/ university education had a significantly more positive attitude (P<0.003) compared to those with less education.

Table 4 demonstrates that almost all the participants received counselling, and one third were not tested for HIV or CD4. Of the 12 participants who tested HIV-positive all received ARV/ART and were tested for CD4. Only 8 husbands were informed, of these seven tested positive.

DISCUSSION

It appeared that two thirds of the mothers had 'moderate' to 'good' knowledge of HIV/AIDS. Other similar studies conducted in Ethiopia, in Hawasa, Tikur and Zewudita Memorial hospitals, found that all participants had sufficient knowledge of HIV/AIDS, and more than 90% of pregnant mothers had heard of HIV/AIDS. The difference in knowledge level in our study could be due to the fact that HIV awareness and PMTCT programme coverage in Ethiopia is more widespread and organized than in South Sudan. [7]

Table 2. Association between PMTCT knowledge level and socio-demographic characteristics of the mothers

Variable	PMTCT knowledge level			Total	P-value
	Poor n (%)	Moderate n (%)	Good n (%)		
Total	31 (12.4)	68 (27.1)	152 (60.6)		
Age group (years)					
Less than 20	10 (18.9)	28 (52.8)	15 (28.3)	53	<0.001
21 to 25	5 (7)	18 (25.4)	48 (67.6)	71	
26 to 30	11 (12.5)	14 (15.9)	63 (71.6)	88	
31 and above	5 (12.8)	8 (20.5)	26 (66.7)	39	
Marital status					
Married	31 (14)	61 (27.6)	129 (58.4)	221	0.054
Not married	0 (0)	7 (23.3)	23 (76.7)	30	
Education level					
Non-formal	30 (30.3)	52 (52.5)	17 (17.2)	99	<0.001
Primary school	1 (1.5)	13 (19.1)	54 (79.4)	68	
Secondary and above	0 (0)	3 (3.6)	81 (96.4)	84	
Occupation					
Housewife	24 (17.9)	48 (35.8)	62 (46.3)	134	<0.001
Employed	7 (6)	20 (17.1)	90 (76.9)	117	

Table 3. Association between attitudes of pregnant women towards PMTCT services and their socio-demographic characteristics

Variable	Attitudes		Total	P-value
	Negative n (%)	Positive n (%)		
Total	123 (49)	128 (51)	251	
Age group (years)				
Less than 20	29 (54.7)	24 (45.3)	53	
21 to 25	36 (50.7)	35 (49.3)	71	0.719
26 to 30	40 (45.5)	48 (54.5)	88	
31 and above	18 (46.2)	21 (53.8)	39	
Marital status				
Married	110 (49.8)	111 (50.2)	221	0.508
Not married	13 (43.3)	17 (56.7)	30	
Education level				
Non-formal	61 (61.6)	38 (38.4)	99	<0.001
Primary school	33 (48.5)	35 (51.5)	68	
Secondary and above	29 (34.5)	55 (65.5)	84	
Occupation				
Housewife	71 (53)	63 (47)	134	0.177
Employed	52 (44.4)	65 (55.6)	117	

Our study showed that the level of education influenced pregnant women's knowledge on PMTCT. The majority of mothers with college/university and secondary education had moderate to good levels compared to those with primary and no education. Similar findings have been reported from Ethiopia and Tanzania. This is due to the fact that many programmes which work on promotion of PMTCT of HIV awareness provide community health education through mass media campaigns, workshops, booklets, magazines, radio and TV to which more educated women have most access. [8, 9]

The study identified that occupation and advance in age of pregnant women have significant associations with the level of knowledge on MTCT risks and PMTCT of HIV. Pregnant women, who were employed and aged 20 years and older, appeared to have sufficient knowledge. Similar findings have been reported from Sudan and Kenya. [10, 11]

More than half of the mothers in this study had a positive attitude towards PMTCT. The finding concurred with the results found in studies from Mombasa, Kenya and a rural area of western Uganda where half of the participants had a positive attitude towards PMTCT of HIV. [12] However different results were obtained in a study from Western Nigeria where less than one third of the participants had a positive attitude. [13]

CONCLUSION

The study concludes that the overall knowledge on HIV/AIDS among pregnant women was 'moderate'. Although the majority of the mothers reported having received counseling for HIV, about one third did not accept the test for HIV. About 75% of the HIV positive women did not receive HAART and more than two thirds reported low use of condoms for family planning and protective purposes.

Recommendations

Improvement of counseling sessions for pregnant women attending ANC at JTH is needed to increase their acceptance and use of services. Doubling effort to achieve the goals of PMTCT among pregnant women is needed. Also there is a need for a similar study at national level, as this study was conducted in JTH and did not represent other settings across the country.

Table 4. PMTCT of HIV services received by mothers

Variable	n (%)
Received HIV counselling	
Yes	231 (92.0)
No	20 (8.0)
Tested for HIV	
Yes	181 (72.1)
No	70 (27.9)
If tested, HIV results	
Positive	12 (6.6)
Negative	169 (93.4)
If positive, received ARV/ART	
Yes	12 (100.0)
CD 4Tested	
Yes	4 (33.3)
No	8 (66.7)
ARV/ART Regimen	
AZT + 3TC +NVP	9 (75.0)
AZT3+TC+EFV	3 (25.0)
If positive, husband was told	
Yes	8 (66.7)
No	4 (33.3)
Husband was tested	
Yes	7 (87.5)
No	1 (12.5)
Husband's results	
Positive	7 (100.0)
Positive husband, kept on ARV/ART	
Yes	7 (100.0)
Positive husband, preventive method used	
Condom/barrier	2 (28.6)
Other methods	5 (71.4)

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Wau Health Sciences Institute graduates 16 students from the School of Midwifery

By James Deng Dimo

Students graduating from Wau Health Institute [Gurtong photo|James Dimo]

WAU 13, December 2018 [Gurtong] - Among the students were 10 females and 6 males. According to the school principal, this is the first batch of diploma students since the establishment of the institute. Jane Edward, the principal said the new graduates are tasked with helping expectant women in hospitals to reduce maternal mortality rates in the country.

"They have been here for three years from 2015 and today they are graduating and we are sure that they are going to save communities with the knowledge that they have gotten here. Our goal is to reduce maternal mortality rates. So through training of these students, they can go and save the community outside," said the principal.

Some of the students that spoke to Gurtong during the graduation expressed their excitement and readiness to save the community in need of their services. "I am Christian Paul, one of the graduates at Wau Sciences Health Institute. Our purpose when we came to this school is to save our country and our people to reduce maternal mortality rates and, of course, as we are going out from here, we are going to do so," said Paul.

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http://www.gurtong.net/ECM/Editorial/tabid/124/ctl/ArticleView/mid/519/articleId/21695/Wau-Health-Sciences-Institute-Graduates-16-Students-From-School-Of-Midwifery.aspx?utm_source=dlvr.it&utm_medium=twitter

Prevalence and associated factors of burnout syndrome among healthcare workers in public and private hospitals in Mekelle City, Ethiopia

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Introduction: Burnout syndrome, an occupational negative psychosomatic condition, has three components: emotional exhaustion, depersonalization and low personal achievement. This study aimed to assess the prevalence of burnout syndrome and associated factors among public and private healthcare workers in Mekelle City, Tigray, Ethiopia.

Methods: A cross-sectional study was conducted among 229 healthcare workers in Mekelle, Kay Kalkidan and Ben Meskerem General Hospitals. An anonymous questionnaire was used for data collection. Pearson Chi-square test and Binary logistic regression analysis were employed. Both tests were conducted at 95% CI with p-value ≤ 0.05 as acceptance area.

Result: Overall 109 (47.6%) of respondents had burnout syndrome. Workers in the private hospitals (65.8%) were more at risk compared to those in the public hospital (44.0%). The lower staff/patient ratio in the private hospitals compared with the public hospital might have contributed to the higher prevalence of burnout syndrome. Independent predictor factors were: being female, few years of work experience, working night shifts and long working hours each week.

Conclusion: Prevalence of burnout syndrome was high among all respondents but particularly those working in private hospitals. Some socio demographic and occupational factors were also implicated.

Keywords: Burnout, hospital healthcare workers, Ethiopia.

INTRODUCTION

Burnout syndrome is an occupational negative psychosomatic stress condition.[1] It follows increased emotional exhaustion, depersonalization and decreased personal achievement. [2]

The emotional exhaustion component is characterized by loss of emotional resources and energy, lack of enthusiasm, frustration, tension, and fatigue. The depersonalization component represents the interpersonal relationships that lead to a negative interaction. The sense of low personal accomplishment refers to the feelings of incompetence.[3]

Burnout is a major concern worldwide in the area of occupational health. All professions, such as teachers and police, may experience it but particularly healthcare providers because they face high demands in quality services and are, for much of the time, subjected to various stressful conditions.[4] It represents a high cost to workers and their institutions and appears to be more common in developing than in the developed countries.[5]

Throughout Africa, including Ethiopia, the human resource crisis has severely affected healthcare quality. The healthcare workforce often carries excessive and sometimes complex workloads that lead to burnout syndrome.[6] Burnout syndrome results in workers having reduced job satisfaction and performance, and an increase in stress-related health problems. [7, 8] This study was undertaken because data from Ethiopia is sparse with only one study from Jimma University Teaching Hospital. [9]

METHOD

The study was conducted among health staff from one public hospital (Mekelle General Hospital) and two private hospitals (Kay Kalkidan and Ben Meskerem

Citation: Redae and Dai, Prevalence and associated factors of burnout syndrome among healthcare workers in public and private hospitals in Mekelle City, Ethiopia, South Sudan Medical Journal 2019; 12(1):17-20

Table 1. Socio-demographic and occupational related characteristics

Characteristics	n / Mean ±SE	(%)
Sex		
Male	67	29.3
Female	162	70.7
Age years	32.48±0.426	
Sleeping hours		
≥8	129	56.3
<8	100	43.7
Years of experience	7.77± 0.405	
Department		
Nursing	123	53.7
Laboratory	21	9.2
Midwifery	20	8.7
Physician	18	7.9
Pharmacy	24	10.5
Others	23	10.0
Working hours/week		
≤40	78	34.1
>40	151	65.9
Night shift		
Yes	143	62.4
No	86	37.6
Total	229	

Note: values are presented means and standard Error (M±SE) for continuous variables, n (%) = frequency and percentages, N= Sample

General Hospitals) in Mekelle city, Tigray Regional State, Ethiopia. According to the inclusion criteria (health care workers who were actively working during the data collection period and had work experience of least one year) 279 individuals were selected. However, as 50 staff did not volunteer to participate, the actual number studied was 229, making the respondent rate 82.8. At the public hospital 191 staff participated and 43 declined giving a respondent rate of 84.4%, at the private hospitals 38 staff participated and 7 declined giving a respondent rate of 81.6%.

We used the Maslach Burnout Inventory (MBI) for health workers, which is an accepted tool for burnout syndrome investigation [10, 11] and SPSS version 20 for data analysis. Results are presented as descriptive statistics, means± standard errors, frequencies and percentages. We used Pearson Chi-square test to compare the level of burnout syndrome and its components among respondents in the public and private hospitals and Binary logistic regression analysis to establish the association of socio-demographic and occupational related characteristics and the status of burnout syndrome. Both tests were conducted at 95% CI with P-value 0.05 as as indicating significance.

RESULTS

Socio-demographic and occupational related characteristics

Table 1 shows the sex, age and other occupational characteristics of the 229 respondents.

Comparison of burnout syndrome and its components among public and private hospital workers

The criterion for burnout syndrome was scoring a high scale in at least two of its components. Overall 109 (47.6%) of respondents had burnout syndrome. Workers in the private hospitals (65.8%) were more liable to burnout syndrome than those in the public hospital (44.0%) (Table 2).

Association between socio-demographic and occupational related variables and burnout syndrome

Binary logistic regression OR [95% CI] model was used to establish association. A significantly higher prevalence of burnout syndrome was found among female compared to male health workers and those with shorter compared to those with longer work experiences. Both working long hours and night shifts had a significant association with high prevalence of burnout syndrome (Table 3). No association was found with marital status, education, income and job satisfaction and relations with managers and colleagues.

DISCUSSION

Prevalence of burnout syndrome was significantly higher among the private hospital workers (65.8%) compared to public hospital workers (44.0%). The lower staff/ patient ratio in the private hospitals compared with the public hospital might have contributed to the higher prevalence of burnout syndrome.

During the data collection period, in the two private hospitals 130 patients were seen by 45 staff (7 were non-respondents) giving a staff/patient ratio of 0.3:1 while in the public hospital 200 patients were seen by 234 staff (43 were non-respondents) giving a staff/patient ratio of 1.2:1.

The overall prevalence of burnout syndrome among the workers was slightly higher (47.6%) compared to a previous study conducted in Ethiopia (36.7%) [9], which may be due to the small number of participants in the private hospitals in our study. It was lower compared to a study in China (76.9%). [12]

In our study burnout syndrome was significantly higher in females than males (Table 3) consistent with a study from Beirut [5]). This could be explained by the higher work burden females have in the home and by cultural standards.

We also found that the prevalence of burnout syndrome was highest among workers having the fewest years of work experience (Table 3) which is consistent with a similar study of midwives in Australia. [13] Workers with a long work experience are more likely to have adapted to their work situations.

Working more than 40 hours/week (Table 3) was a

Table 2. Comparison of burnout syndrome among public and private hospital workers.

Variable	Public hospital n(%)	Private hospital n(%)	Total n(%)	X^2	p– value
Emotional exhaustion					
Low	37(19.4)	9(23.7)	46(20.1)		
Moderate	53(27.7)	2(5.3)	55(24.0)	8.838	0.012*
High	101(52.9)	27(71.1)	128(55.9)		
Depersonalization					
Low	47(24.6)	6(15.8)	53(23.1)		
Moderate	76(39.8)	8(21.1)	85(37.1)	10.09	0.006**
High	68(35.6)	24(63.2)	91(39.7)		
Personal accomplishment					
Low	49(25.7)	5(13.2)	50(21.8)		
Moderate	54(28.3)	15(39.5)	70(30.6)	3.43	0.180
High	88(46.1)	18(47.4)	109(47.6)		
Burnout syndrome					
Yes	84(44.0)	25(65.8)	109(47.6)	6.04	0.020*
No	107(56.0)	13(34.2)	120(52.4)		
Total	**191**	**38**	**229**		

*Note: n = frequency, BOS= Burnout Syndrome, OR= Odds Ratio, P= P- value from the binary logistic regression model CI 95%, *p statistically significant P <0.05, **P statistically significant P<0.01.*

Table 3. Association of socio-demographic and occupational characteristics with burnout syndrome.

Characteristics	Variable	N	Burnout syndrome OR[95% CI]	p-value
Sex	Male	67	Reference	
	Female	162	3.02[1.44-6.32]	0.003**
Years of experience	≤ 5	107	14.12[4.25-46.84]	0.000**
	6-10	68	3.56[1.19-10.68]	0.023*
	11-15	25	2.71[0.73-9.95]	0.133
	≥16	29	Reference	
Working time hours	≤40	78	Reference	
	>40	151	0.24[0.10-0.54]	0.001**
Night shift	No	86	Reference	
	Yes	143	0.44[0.20-0.95]	0.037*

*Note: n = frequency, BOS= Burnout Syndrome, OR= Odds Ratio, P= P- value from the binary logistic regression model CI 95%, *p statistically significant P <0.05, **P statistically significant P<0.01.*

contributing factor to burnout syndrome which is in line with results from Turkey and England.[4, 14] The reason could be that those working long hours have longer exposure to stress. Working at night was significantly associated with burnout syndrome as it was in other similar studies.[4, 13] This may be due to disrupted sleep patterns and the fatigue related with it.

This is the first study to compare the prevalence of burnout syndrome between two hospital groups in Ethiopia. Its limitations were that it was confined to one city and that there were fewer participants in the private hospitals than in the public hospital.

CONCLUSION

The high prevalence of burnout syndrome, particularly among workers in private hospitals, was associated with being female, having fewer years of work experience, long working hours and working at night.

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QUIZ

What are the 10 threats to global health in 2019 according to WHO? See answer on page 27

Regulatory challenges in a complex emergency environment: An update on South Sudan

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INTRODUCTION

A complex emergency is defined as a situation of disrupted livelihoods and threats to life produced by warfare, civil disturbance and large-scale movements of people, in which any emergency response has to be conducted in a difficult political environment. [1] This was a precise description of the situation in South Sudan until the recent signing of a peace agreement between the warring parties. It is a land locked country with an estimated population of 13 million in 2018. Rebuilding damaged infrastructure and restoring damaged livelihoods will probably last decades.

South Sudan remains a very pertinent example of a 'limited resource' state faced by overwhelming and unprecedented complex emergencies in spite of possessing the third largest oil reserves in sub-Saharan Africa, untapped mineral reserves, massive agricultural potential and abundant water towers. The country gained independence from Sudan in 2011 after a protracted civil war that cost both countries hundreds of thousands of lives. It has some of the worst health care indicators in the world and its formal and informal healthcare sectors remain largely unregulated.

BACKGROUND

South Sudan experienced a devastating civil war from 2013 until recently when an uneasy peace agreement was signed. The war led to an economic, security and political crisis with thousands of internally and externally displaced citizens who continue to have inadequate access to basic services. Of particular concern is the very poor state of health care services and the challenges faced by the regulatory authorities.

Approximately 50% of the 700 medical doctors, dentists and pharmacists in the public sector are not registered with the South Sudan General Medical Council (SSGMC), the official regulatory body for medical doctors, dentists and pharmacists as well as healthcare institutions. Possible reasons for the failure to complete the registration process four years after the establishment of the regulatory body include restricted access to remote parts of the country, inability to cross battle lines in war zones and limited capacity of the centralised regulating government institution.

In addition, ongoing demographic and epidemiological

Figure 1. Urban migration in Unity State. (©Dominic Nahr/ MAPS. Published with permission from MSF)

transitions compounded by the security situation have driven rural populations to urban areas (Figure 1). This migration to urban areas in search of security has put a strain on the public health care system and opened the door to an unregulated informal commercial health care sector. We cannot underestimate the challenges of effectively regulating health care services and professionals in an unstable and insecure environment. The SSGMC has not achieved most of its stated strategic objectives that were set out when it was established almost 4 years ago in spite of utilising all the resources available to it. Various regulatory strategies are available to regulate health care and various researchers have reported on their advantages and disadvantages. [2, 3] The regulatory strategy used in South Sudan, as dictated by the SSGMC Act, is the 'Command and Control' strategy administered through state- centred institutions. These state controlled bodies may not often have the capacity or willingness to monitor and enforce health care regulation effectively.

STATEMENT OF THE PROBLEM

Health care regulation through a centralised state institution has not been effective in controlling behaviour in the public and commercialised health care sector in South Sudan as it does not possess the power to monitor and enforce. Limited resources, insecurity and powerful

countervailing commercial incentives that encourage deviant behaviour to continue has rendered the centralised command and control strategy of the state institution ineffective.

DISCUSSION

The quality, nature and cost of health care services provided in private hospitals, clinics, and traditional healing centres remain largely unregulated. Many of these centres enjoy the patronage of powerful personalities with little tolerance to any activity that might undermine their businesses and erode their profits.

Informal Commercialised Health Care Sector

Of particular importance and concern is the role of the informal health care sector, including informal pharmacies and drug retailers. This sector is often the first point of contact for the poor in South Sudan and generally fills the void left by the failing public sector which has also been adversely affected by the deteriorating security situation and financial downturn in recent years (Figure 2).

The country is also experiencing the emergence of a new middle class that has created a demand for better quality and hospital-based care that cannot be provided by the struggling public health care system. Commercial health care provision including the informal sector is an increasingly important source of health care for all socio-economic groups in South Sudan but have remained largely unregulated. This has impacted negatively on the quality and access to health care in South Sudan.

NEGATIVE EFFECTS OF UNREGULATED COMMERCIALIZED HEALTH CARE SYSTEMS

Quality control

When left unregulated, the quality of care from private health care providers remains a major concern, with respect to harmful practices and poor technical quality, especially among informal or non-institutional providers. [4] The quality and type of medications dispensed by some private health care providers is virtually uncontrolled due to linguistic issues and inability to verify credentials. They also enjoy political goodwill and patronage that complicates regulating their activities. There is a strong presence of foreign health care providers in South Sudan working in partnership with local business entities. Efforts to regulate this sector has been a major challenge due to the prevailing insecurity, patronage and system failures.

Information asymmetry

With ineffective central regulation, patients and consumers are unaware of prices or unable to assess quality of care, and this has contributed to supplier-induced demand and increasing costs of healthcare in the country. [4] Provision of medicines and medical care is seen as a business by providers, with increasing consumerist behaviour witnessed among purchasers (Figure 3). The average South Sudanese patient has the misconception that the more expensive a medicine is and especially if it is in injection form, the more effective it is. The informal commercialised providers have cashed in on this misconception and are virtually injecting every patient they see. This behaviour will continue until health care information systems are better regulated and improved.

Figure 2. Commercialised health care provision. Dispensing medicines (© 2018 SSGMC)

Consumer Protection

There is no or little previous or ongoing research to obtain verifiable data on the behaviour of the commercialised formal and informal sectors. Sensational media stories are frequent relating to severe morbidities and mortalities occurring in the commercialised health care sector. Introduction of accreditation systems are still beyond the horizon in South Sudan. Accreditation systems to improve quality of care require the development of complicated regulatory instruments, technical and management capacity. With no official data available on the behaviour and activities of commercial informal health care providers, basic regulatory instruments, such as licensing and registration of facilities and providers remain inadequate and difficult to enforce.

Equity of Access

The few qualified and regulated private health care providers are mostly not accessible or affordable by the poor, who rely on private informal providers that are largely unregulated. [5] This situation underscores the necessity of properly regulating the informal commercial sector to provide effective and safe health services to the poor.

A 2007 study identified a number of factors that make it difficult for regulatory systems to work efficiently and effectively in low and middle-income countries. [6] We have identified four main factors in South Sudan that could be negatively impacting efforts to effectively regulate the health care sector in the country:

- Lack of institutional development with skilled personnel and dedicated departments or units, appropriately equipped to enforce rules.
- Poor enforcement due to inadequate monitoring and information systems as well as mechanisms for decision making about violations and guidelines on when and how to apply sanctions.
- Difficulties in managing the medical profession due to underdevelopment of medical associations that self-regulate the profession to supplement the regulatory instruments such as licensing and registration.
- The quality of education, training and continued professional development of medical doctors, dentists and pharmacists is poorly monitored.

CONCLUSION

The centralised bureaucratic regulatory model of health care may not be appropriate in a country with limited resources experiencing complex emergencies and unable to control deviant behaviour. Critically analysing the institutions and dynamics of other existing regulatory systems is required with the aim of developing hybrid more effective and efficient systems that would be more suited to South Sudan and perhaps other countries in similar situations. There is empirical research evidence that indicates regulatory models used in developed countries or inherited from colonial systems are not suitable for countries experiencing complex emergencies and a break down in the rule of law and order.

Targeted research to provide evidence on the efficacy of low cost decentralised approaches that involve a mix of regulatory strategies by state, private and civil society actors is needed. The findings would guide policy makers in reforming current inefficient health care regulatory systems in fragile states besieged by complex emergencies.

Figure 3. Information asymmetry. (© 2018 SSGMC).

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Too hot to handle? Heat resilience in urban South Sudan

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South Sudan is at risk from the impact of climate change. This paper reviews the climate change issues faced by South Sudan, and the strategy as outlined to the United Nations. The author argues that the policy overlooks a key potential cause of future morbidity and mortality: increased ambient temperatures, particularly in urban centres due to the urban heat island effect. The capital is especially susceptible to heat-related mortality as it faces a 'triple threat': rapidly rising temperatures, an at-risk population profile, and inadequate planning for the pressures of urbanisation. Four low-cost, evidence-based recommendations are given to mitigate the impact of heatwaves on human health, and it is concluded that South Sudan has great potential to become a regional leader in heat resilience.

Keywords: climate change, urban heat island, heatwave, heat illness, Juba

INTRODUCTION

South Sudan is one of the five countries deemed to be most vulnerable to the impact of climate change. [1] This paper will discuss the country's climate challenges and review its climate change strategy. The effects of increased urban temperatures on human health will be considered and it will be argued that Juba is especially susceptible to significant heat-related mortality given its climate, vulnerable population, rapid urbanisation, and limited urban planning. Four low-cost, evidence-based, actionable recommendations to improve Juba's heat resilience in anticipation of rising temperatures are proposed.

CLIMATE CHANGE CHALLENGES TO HUMAN HEALTH

South Sudan is particularly vulnerable to climatic variability. Most citizens are dependent on rain-fed subsistence farming for their livelihoods. Summer rains have already decreased by over 20% in the past two decades. [2] The risk from both drought and flooding are projected to increase with climate change, reducing food security and promoting the spread of water-borne diseases such as cholera. [3] Indeed, studies from the East African region suggest that climate change will increase the risk of various infectious diseases, including Rift Valley Fever, Ebola Virus Disease, meningococcal meningitis, and trypanosomiasis. The effect of climate change on malaria is debated. Evidence suggests that global warming will lead to a geographical shift in hyper-endemic regions from West to East Africa, and malaria incidence will increase in mountainous regions which previously were at low-risk. These findings are relevant to South Sudan, which is in the path of the West to East shift and has mountainous regions to the south. [4]

CURRENT MITIGATION AND ADAPTATION MEASURES

South Sudan is a signatory to the Paris Climate Change agreement and in 2017 delivered its National Adaptation Program of Actions (NAPA), [5] which built on the 2015 Intended Nationally Determined Contribution (INDC) to the UN Framework Convention on Climate Change (UNFCCC).

Due to conflict, and lack of technical and economic resources, South Sudan has not produced data concerning greenhouse gas emissions. It is estimated that per capita emissions are low as only 1% of the population has access to electricity. [6] Thus, the focus of NAPA and the INDC was on sustainable development and adapting to climate change. NAPA set out four key policy areas:

1. Protection of South Sudan's forests, promoting agro-forestry, reforestation, and developing protected nature reserves;
2. Implementation of water resource management, with development of infrastructure (reservoirs and irrigation and sanitation systems);
3. Promotion of 'climate-smart' agricultural practices e.g. drought-resilient crops and livestock;
4. Disaster risk reduction through capacity-building for weather prediction and creation of early warning systems.

However, political instability and conflict have hampered progress. [3] As of 2018, South Sudan still has no national forestry policy, hydroelectric development efforts have stagnated, and the risk of famine remains high.

Figure 1. Urban development in Juba (© Rachel Ayrton)

HEAT-RELATED ILLNESS IN URBAN SOUTH SUDAN

Juba is South Sudan's commercial and political capital, with an estimated population of 365,000. [7] In recent years, Juba has seen an influx of migrants seeking employment and educational opportunities and/or driven from rural areas by crop failures and famine. [8] Rapid urbanisation, combined with political instability and under-resourcing, has led to poor urban infrastructure and city planning (see Figure 1).

Juba is at the centre of a 'triple threat' of heat-related illness: it is warming at 0.4^{0}C per decade (more quickly than almost anywhere else on earth) [2]; it is home to a vulnerable population that is ill-equipped to adapt to increased temperatures; it is undergoing rapid unplanned urban expansion. The urban heat island effect causes cities to experience higher temperatures for longer periods relative to rural areas. A significant gap in South Sudan's climate change policy is that it does not outline how the urban built environment should be planned to mitigate the detrimental effect of heat on human health.

Juba's average temperature ranges between 26–32^{0}C. Temperatures above 31^{0}C are related to increased mortality. [9] There are currently no data regarding heat-related illness in South Sudan, but evidence from sub-Saharan Africa suggests increased mortality with increasing temperature for children under five and adults over 65. [10, 11] The World Health Organization predicts that (without adaptation) heat-related deaths in East Africa from over 65s will exceed 13,000 per year by 2050. [12] Young children have under-developed thermoregulation systems and are at greater risk from high ambient temperatures. Heat and diarrhoeal diseases compound the risk of dehydration. Hence, Juba's under-five year olds are especially vulnerable to the heat threat. The burden of heat-related mortality also falls disproportionately upon women, the uneducated, and the poor [13] which highlights the issue of health inequality.

Evidence from other sub-Saharan capital cities suggests that informal settlements, typically seen in rapid urbanisation, are especially susceptible to heatwaves. [14] Therefore, it is imperative that government agencies act now to implement heat-resilient urban planning policies.

RECOMMENDATIONS

Urban parks

The area surrounding Juba is verdant close to the White Nile. Urban green spaces and trees are known to reduce urban temperatures. [15] Partner organisations have identified suitable areas for grassland and 'green corridors' in Juba and its surroundings. [16] Parks in Addis Ababa have been shown to mitigate the urban heat island effect. Thus, creating designated parks in the plentiful green space around Juba now would significantly increase the heat resilience of the city as it expands. There is evidence that access to green spaces reduces health inequalities. [17]

With the creation of urban parks, there must also be an effort to promote reforestation with urban trees. These are highly effective in improving air quality by reducing air pollution. [18] In the absence of an enforced limit on emissions, reforestation offers a low-cost measure to reduce the exposure of the urban population to air pollutants. In its post-conflict reconstruction, Rwanda has become a global leader in reforestation – South Sudan could demonstrate similar leadership in this area.

Cool surfaces

South Sudan has few paved roads. Surfaced roads are a necessity for efficient transport but asphalt contributes significantly to the urban heat island effect. This provides the opportunity to pave urban areas using new, resilient materials that reflect heat and are more durable than asphalt. As a first step, the simplest measure to reduce the temperature of a city is to paint its surfaces (in particular roads and roofs) white. A further measure is to implement 'green roofs' (roofs of vegetation), which have been shown to reduce nocturnal ambient temperatures by up to 3^{0}C. [19] These are most effective in low-rise buildings (under 2.5m). There is a knowledge gap when implementing green roofs in the developing world. This offers an opportunity for South Sudan to become a leader in these initiatives.

Bluespace

Juba's proximity to the White Nile can be harnessed to divert cooling water, to create canals and 'bluespace' within the city. Urban water can work with parks and trees to enhance further cooling. Indeed, meta-analysis has shown that urban bluespaces may reduce temperatures by up to 2.5^{0}C. [20] South Sudan has already committed to building canals and waterways as part of its water resource management strategy and should be extended as part of its heat resilience strategy.

Cooling centres

Air conditioning is protective from heat-related morbidity and mortality. It is not feasible (and indeed undesirable) for all buildings in Juba to have air conditioning. It has been suggested that 'cooling centres' should be set up so the most at-risk – those with chronic diseases and those at extremes of age – may shelter in times of extreme heat. [21] Air conditioning units generate heat and typically rely on fossil fuels and therefore should not form the centrepiece of a city's heatwave strategy. Nonetheless, designated public air-conditioned spaces in Juba, accessible to the most vulnerable sections of society, would provide an effective and equitably mortality-reducing measure if implemented in addition to other recommendations.

CONCLUSION

Sub-Saharan Africa will disproportionately shoulder the burden of extreme heat events caused by climate change. This review has argued that increases in ambient temperature, driven by global warming, pose a significant and inequitable threat to the health of the South Sudanese living in urban centres. Four evidence-based recommendations have been offered. South Sudan can leverage its existing development links to build local urban planning capacity and ensure that further urbanisation is heat-resilient. The upcoming partnership with Moroccan and South Korean agencies planning the construction of a new capital at Ramciel [22] offers an opportunity for the country to become a regional leader in climate-smart urban strategies.

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ANSWERS TO QUIZ FROM PAGE 20

WHO: Ten threats to global health in 2019

https://www.who.int/emergencies/ten-threats-to-global-health-in-2019

1. Air pollution and climate change
2. Non-communicable diseases
3. Global influenza pandemic
4. Fragile and vulnerable settings
5. Antimicrobial resistance
6. Ebola and other high-threat pathogens
7. Weak primary health care
8. Vaccine hesitancy
9. Dengue
10. HIV

The mental health treatment gap in South Sudan

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What is a mental health treatment gap?

A mental health treatment gap is the percentage of individuals who require treatment in a country or in a defined community but do not receive it. The reasons for this include: non-availability or poor access to services and stigma. [1]

How large is the gap in South Sudan?

South Sudan has one of the largest mental health gaps in the world. The World Health Organization (WHO) estimates that during humanitarian emergencies, rates of mental health disorders can increase up to 4% for severe conditions and up to 20% for mild to moderate disorders requiring care and support.[2] South Sudan Health Cluster projections estimated that 5.1 million people are affected by the ongoing humanitarian emergency in the country. [3] This amounts to an estimated 204,000 people with severe and 1,020,000 people with mild to moderate mental health conditions in South Sudan. This could be imputed to conditions resulting from the humanitarian situation. In contrast, current humanitarian efforts by various partners are reaching less than 10,000 persons per year (1%). Therefore, the estimated mental health treatment gap among the population of humanitarian concern is a staggering 99%.

Why do we have a mental health treatment gap in South Sudan?

Mental health conditions are prevalent and untreated in the population. [4] A study in Juba found that 36% of the sampled population met the criteria for Post Traumatic Stress Disorder (PTSD). [5] In addition to this, rates of mental health disorders increase during emergencies. The low level of resources allocated to mental health services limits their ability to reach affected people. There are still unprecedented levels of stigma directed to persons with mental health disorders in the country, this discourages people from accessing help. [6] The poor performance of mental health services contributes further to the treatment gap. In many situations the services are unavailable, inaccessible and inadequately supervised.

What are the implications of the mental health treatment gap?

The huge treatment gap means that persons with mental health disorders that are not receiving the care and treatment they require are likely to function poorly in the community. This drives them and their families deeper into poverty. In addition, due to limited participation in community activities and limited employment opportunities, many are likely to have a poor quality of life. Rates of teenage pregnancy and domestic violence are likely to increase. Moreover, persons with untreated mental health conditions have increased mortality rates. Mental health legislation is intended to ensure that people with mental health disorders receive the care they need and to which they are entitled. A consequence of lack of such legislation in South Sudan is that, many people with mental health disorder are likely to be incarcerated even if they have not committed a crime.

Table 1. Impact of disasters on the prevalence of mental health conditions

Disorders	Before disaster: 12-month prevalence	After disaster: 12-month prevalence	Estimate total cases with mental health condition for the population of humanitarian concern (5.1million. source:- Health Cluster – June, 2018[3])
Severe disorder (e.g., psychosis, severe depression, severely disabling form of anxiety disorder)	2-3%	3-4%	204,000
Mild or moderate mental disorder (e.g., mild and moderate forms of depression and anxiety disorders)	10%	15% - 20%	1,020,000
"Normal" stress reactions (no disorder)	No estimate	Large percentage	No estimate

Source: Van Ommeren et al. BMJ; 330:1160-1; 2005; http://www.bmj.com/content/330/7501/1160/suppl/DC1 [2]

What can be done to reduce the mental health treatment gap?

Service re-organization and expanded coverage: This entails discouragement of plans to establish long-stay psychiatric institutions but instead to invest in outpatient and inpatient mental health services in general hospitals. Mental health services should be integrated into other health programmes such as the Boma Health Initiative, primary and secondary health care as well as traditional health practitioners (traditional healers) services. The establishment of community services such as home and emergency outreach, rehabilitation and supported housing facilities will contribute to closing the treatment gap.

Implement Integrated and Responsive Care: this involves linking people to available resources elsewhere and cultivating recovery oriented care. It is also important to empower people with mental health disorders and their families. Resources should be allocated to ensure the availability of medicines and provision of services for people facing adverse life events in line with the WHO Quality Rights Standards.

Address resource planning: including capacity building for mental health in non-specialized health settings (primary health care and general hospitals) using the WHO Mental Health Gap Action Programme – Humanitarian Intervention Guide (mhGAP – HIG). There is a need for task definitions, referral structures and supervision for trained health workers. It is also important to improve the capacity for social care workers (clinical, human rights and public health); and improve the working conditions for the mental health workforce.

Leadership: Improve government stewardship and prioritization of mental health across line ministries.

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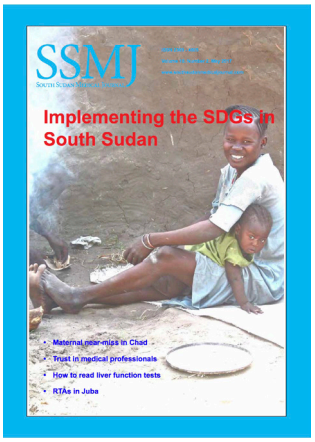
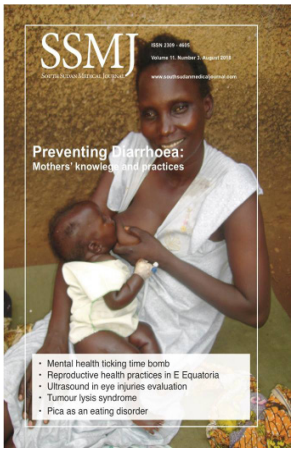
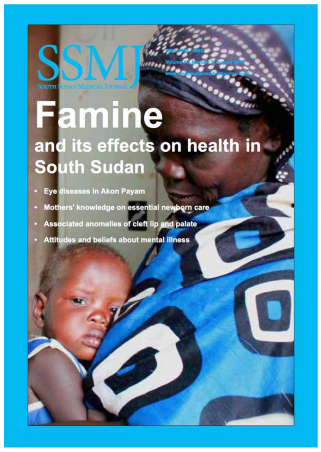
Call for Submissions

South Sudan Medical Journal Special Issue on Primary Health Care, May 2019







The Alma-Ata Declaration of 1978 adopted the primary health care (PHC) approach as the basis for achieving the goal of "Health For All". Sudan was among the first countries to adopt and implement the PHC model. The world met again, after 40 years, on 25 – 26 October 2018 in Astana, Kazakhstan, "to renew a commitment to primary health care to achieve universal health coverage and the Sustainable Development Goals".

According to WHO, at its heart, "primary health care is about caring for people, rather than simply treating specific diseases or conditions. PHC is usually the first point of contact people have with the health care system. It provides comprehensive, accessible, community-based care that meets the health needs of individuals throughout their life".

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Dr Felix: the doctor who served with passion

By Dr Edward Eremugo Luka

Editor-in-Chief, South Sudan Medical Journal, Email: opikiza@yahoo.com

Dr Felix Loro Lado Laki, affectionately called Yaya by friends and family, had touched many peoples' hearts in his life – a life cut short by cancer.

His colleague Juliana shared a story on Facebook which showed how dedicated he was about his work. As a senior staff member in a primary health care programme, Dr Felix was visiting a health facility on routine supervision and was shocked at the state the maternity and delivery room – "An unfinished building, gaping holes where windows and doors were supposed to be so no privacy -there was literally a path leading to the village in the 'window' next to the maternity bed - and worse of all, a pungent smell of bat urine emanating from the roof." His stern rebuke of the organization running the facility that "I would even not let my goat birth in this room" was so strong and forceful that they had no choice but to close the room and start renovation immediately. That was how passionately he took his responsibilities. He left many colleagues with similar memories of his work.

Following his graduation from the College of Medicine, University of Juba in 1994, Dr Felix worked in several hospitals and posts in Sudan, as medical director for Wadi Saidna Hospital in Khartoum and Wad Habuba Rural Hospital in El Gezira.

In the early 2000s, Dr Felix moved to South Sudan and worked for the organization American Refugee Committee (ARC) International, in Kajo Keji and Magwi Counties, where he held the position of Clinical Trainer and Acting Primary Health Care Co-coordinator. He also worked for CARE International Somalia / South Sudan Programme in North Bor County, South Sudan holding the position of Primary Health Care Project Manager.

He developed his passion as a skilled public health specialist whilst working as a health advisor for Jones Snow, Inc (JSI) from 2007 to 2009, and Management Sciences for Health (MSH) from 2009 to 2012. His dedicated interest in Monitoring and Evaluation (M&E) as a field of choice gave him the opportunity to serve as the M&E Director for the Integrated Service Delivery Project (ISDP) with Jhpiego from 2012 to 2016. I worked with him and shared an office during these two periods. His work ethic was phenomenal. He stayed late at work and came earlier than anyone the next day.

Dr Felix Loro was diagnosed with Non-Hodgkin's Lypmphoma in 2014, which claimed his life on Saturday 12 January 2019 in Kampala, Uganda. Dr Felix was married to Mrs Maria Ejok Kanisio from Hiyala, Torit State. They were blessed with two children – a son and a daughter.

His passion for his country had inspired individuals, for whom he served as a mentor and role model. He will be greatly missed. Rest in peace, Dr Yaya.