

Please note issue 24 has now been translated into French and is now available on our ILDS website, www.ilds.org.
 Veuillez noter que le numéro 24 a été traduit en français et est maintenant disponible sur notre site, www.ilds.org.

COMMUNITY DERMATOLOGY JOURNAL – What's in a name?

Christopher Lovell, Michele Murdoch

Editors

Claire Fuller

Chair, International Foundation for Dermatology

Since its birth twelve years ago in the hands of Dr Paul Buxton, this publication has had the name **Community Dermatology**, later becoming **Community Dermatology Journal**. However, the Editorial board have been conscious that this title does not accurately reflect our readership.

Globally, health workers in a wide range of disciplines look after patients with skin disease and strive to improve the skin health of the communities they serve. Numerically, dermatologists play a small, if vital, part in this. We propose changing the title of the journal to **Community Skin Health**, with effect from the next issue (no.27), and we believe this title gives a better description of the aims and objectives of the journal and the International Foundation for Dermatology.



Health centre in South West Cameroon.



Health centre at Debarq, northern Ethiopia.

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Dermatological Care in Rural Nepal – a journey to reach the unreached

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KEY WORDS

skin diseases, primary health care manual, mobile teledermatology, remote Nepal

Abstract

Skin disease is one of the leading causes of morbidity in Nepal, with a very high prevalence and a large impact on the quality of life. Most of the population, in particular those living in rural and remote areas, do not have access to dermatological care.

The objectives were to determine the prevalence and impact of skin diseases in Nepal and develop interventions to reduce their impact.

A questionnaire, Skin Disease Disability Index, to assess the impact of skin diseases on quality of life was developed. Then a large population was studied to determine the prevalence and impact. The prevalence was 25% and there was very high impact on the quality of life.

An illustrative atlas, Skin Disease-Primary Health Care Manual, was developed for the health workers. Mobile teledermatology was studied to assist the medical officers in the treatment of skin diseases and simultaneously train them to manage common skin diseases.

An internet application, DCRN, has been developed recently, to provide consultation and training to the medical officers.

Background

Those of us working in a country like Nepal know the hardships of individuals with health problems. They have to travel far and spend a lot of money, to seek treatment for even common health problems like skin infections.

Living in this reality, we had a strong feeling of the need to take skin care to the populations living in the rural and remote areas of Nepal, who cannot afford and do not have access to skin care.

In the year 2010, I had the good opportunity of meeting Professor Inger Rosdahl from University of Linköping, Sweden, who then was a visiting professor in Kathmandu Medical College, Kathmandu. We shared our thoughts and what we can do regarding skin care in Nepal. With the motto "Skin Care for All" (from International Society of Dermatology), we formed a team of dermatologists, Prof. Rosdahl, myself, Dr Dipendra Gurung and Dr Rushma Shrestha, later joined by Dr Suwash Baral. Thus began a challenging and fruitful journey to take skin care to the unreached populations of Nepal.

Skin diseases (SDs) are one of the leading causes of morbidity in Nepal and the overall prevalence of skin diseases was 25% in our previous study from rural areas of Central Nepal¹. There was a large impact on the quality of life of these villagers.

In South East Asia, Nepal is among the poorest developing nations with most of the population (85%) living in rural and remote areas with difficult and inaccessible terrain. Health care in these areas is provided by health workers (nurses) in health posts and medical officers (general practitioners) in primary health care centres and district hospitals.

Basic health care is provided by the Ministry of Health. Although most of these services are free, they are not necessarily always available. Specialist care is only available in hospitals of the big cities or in the medical colleges.

There are 169 dermatologists in Nepal², for a population of more than 26 million³, and all of them work in big cities. The medical officers and the health workers do not have adequate training to treat common SDs. Most of the Nepali population do not have access to dermatological care.

SDs are not given due importance in the national health care system and very little or no resource is allocated for this speciality. One of the reasons may be that SDs cause high morbidity but less mortality, and the latter is taken to prioritize diseases for resource allocation. The other seems to be the complete lack of advocacy from the part of the dermatologists.

Most common SDs (70% of all SDs)¹ may not require hospital admission and laboratory investigations for the treatment. They can be prevented and treated in the primary health care centres, provided that specialist dermatological care and required medications are available.

We were convinced that it is possible to take skin care to the primary health care centres, hence to the rural and remote populations.

First and foremost was the lack of scientific data regarding SDs in Nepal. The only data available was from the Annual Health Reports of the Ministry of Health, where SDs were ranked among the 5 to 10 most common health problems in Nepal⁴, for which the population sought health care.

Our first task was to obtain scientific data regarding the health burden due to skin diseases in Nepal.

I had already conducted a pilot study in a village in the outskirts of Kathmandu valley in 2009. In this study the prevalence of skin diseases in the village was 20.1% and there was a large impact on the quality of life⁵. The impact on quality of life was assessed with DLQI.

We developed a project, "Dermatological Care in Rural Nepal (DCRN)" with two broad objectives:

- To determine the health burden due to SDs (prevalence and impact) in Nepal
- To develop interventions to reduce the health burden due to SDs

Skin Disease Disability Index (SDDI)

We had impression that DLQI was not totally appropriate in the Nepali society, which is different socio-culturally and economically from the country where it was developed. It was very important that we had a tool to measure the impact on quality of life, so that we could generate some scientific evidence that supported that SDs have significant impact on quality of life, although they usually do not cause death.

In the first study we developed and validated a questionnaire, SDDI, to measure the impact of SDs on the quality of life, in 2011⁶. It is composed of 10 questions which addressed the effect on 6 aspects of life – general wellbeing, work/school/play, daily activities, psychological wellbeing, social relations, and treatment.

Prevalence and impact of SDs in the Central Development Region

Subsequently we conducted a much larger study in 2012 to determine the prevalence and impact on quality of life due to SDs, in 4 districts, one from the mountains, 2 from the hills and one from Terai (southern plains with hot and humid climate). A house to house survey was conducted to obtain socio-demographic data and identify inhabitants with skin diseases. Then skin health camps were conducted in the same areas, during which SDs were diagnosed and patients interviewed with SDDI.

The overall prevalence of SDs was 25% with significantly higher prevalence in females (30.1%) than males (19.7%). The prevalence was higher in Terai district (39.9%) compared to the mountain district (17.5%). The most common SD categories were eczemas, followed by pigmentation disorders, fungal infections, naevi and urticaria. We used our own questionnaire, SDDI, to assess the impact on quality of life and there was a very large impact (score 13.7) on quality of life¹.



Fig.1. Vitisigo.

From this study we concluded that there is very high prevalence of SDs with large impact on the quality of life, hence the health burden due to SDs is significant. Although benign naevi do not



Fig.2. Chronic leg eczema.



Fig.3. Infected scabies.



Fig.4. Acne.

significantly contribute to the burden of skin disease, there is a need to identify atypical lesions and we suspect that the incidence of melanoma is under-reported.

Having obtained baseline data of prevalence and impact, we developed three interventions with the objective of providing dermatological care to the populations living in rural and remote areas.

Continued overleaf...

Skin Disease-Primary Health Care manual (SD-PHC manual): This is an illustrative manual, developed in 2013, with primary treatment of 17 most common SDs and 5 preventive measures. It is for health workers working in health posts where there are no doctors. The manual was tested during a 2 day training workshop for the health workers, in 2014. We plan to distribute the manual to a larger group of health workers in collaboration with the Nepalese Ministry of Health with the aim of further review.

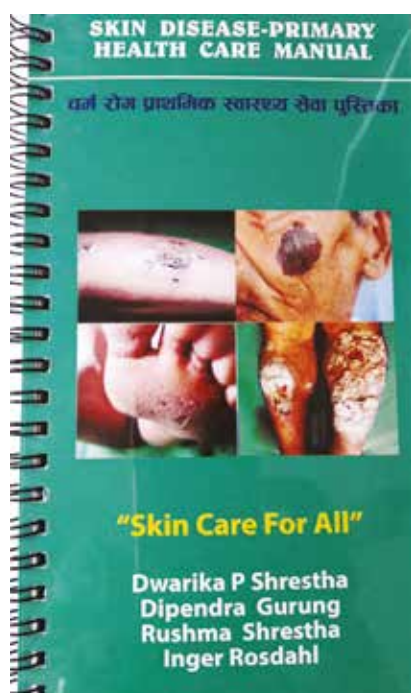


Fig. 5. SD – PHC manual.

Mobile teledermatology (MTD) consultation:

The next step was to assist medical officers working in primary health care centres and district hospitals, to diagnose and treat common skin diseases. Considering the rapid development of wireless internet and widespread use of mobile phones, we studied the possibility of providing dermatological consultation by mobile phone to the medical officers in the rural health care centres in 2015. The overall concordance between the MTD consultation and face to face consultation was 88%. This is a cheap, feasible and valid way of providing dermatological consultation.



Fig.6. Mobile teledermatology consultation.

Training of medical officers via MTD: While conducting the previous study, we realized that the medical officers can be trained simultaneously to manage common skin diseases. Hence we developed a training package, which consisted of 12 days of outpatient clinic days, with MTD consultations, where the medical officer has to see a minimum of 60 common skin diseases. We conducted this study in 2016⁸ and found it to be effective and valid.

DCRN app

In both of above MTD studies, we used Viber app. Now we have developed our own DCRN app and we are studying its use.

Conclusions

We have put a lot of effort and spent many enjoyable years in this project. We planned the project in a way that the patients with SDs benefitted from the start. The major part of our activities was conducting skin health camps. We conducted around 20 dermatological health camps, where we provided free consultations and medicines to more than 4000 villagers in rural and remote Nepal.

The other activities consisted of in-depth interviews, focus group discussions and expert panel meetings.

Our work was presented in all the national dermatology conferences, and some international conferences. Most of our work has been published.

We are convinced that we have studied and developed a simple, feasible, cost-effective and reliable model of providing dermatological care to the needy populations in the rural and remote areas. It is unlikely that dermatologists will be available in these areas in near future.

Our next challenge is to integrate our work into the national health care system of Nepal, so that skin care can be made available gradually to the needy populations living in far off areas with difficult terrain, all over the country.

Acknowledgements

Prashant V Shahi, Prof. Sivert Lindstorm, Dr Dilip Chaudhari, Dr Sonya Gupta, Dr Shristi Shrestha, Dr Amit Amatya, Dr Sabeena Bhattarai, Dr Govinda Pokhrel, Dr Bharat Pradhan, Dr Mahesh Maskey, University of Linkoping

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Fig. 7. DCRN app.

UPDATE ON ONCHOCERCIASIS

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Global prevalence

The policy for onchocerciasis control in Africa, where 99% of the world's at-risk population live, has shifted from morbidity control to one of elimination of infection. Mass drug administration with ivermectin is being used to try to eliminate onchocerciasis from Africa by 2025. The Global Burden of Disease (GBD) Study is an ambitious project which provides estimates of the prevalence, morbidity and mortality of the world's most important diseases. The most recent published data in the GBD Study 2016 estimated a global prevalence of onchocerciasis of 14.65 million, representing a reduction of 13.6% since the GBD Study 2013. As onchocerciasis is mainly a non-fatal disease, its public health importance is best understood in terms of DALYs (DALYs = Years of Lives Lost (YLL) + Years Lived with Disability (YLD)). In 2016 onchocerciasis was ranked as the country's first leading cause of YLDs for Liberia, the second leading cause for Democratic Republic of Congo and South Sudan, the fifth for Cameroon and the sixth cause for Central African Republic and Sierra Leone.

Vos T, Abajobir AA, Abbafati C et al. Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990-2016: A systematic analysis for the Global Burden of Disease Study 2016. *Lancet* 2017; **390**: 1211-1259, doi:10.1016/S0140-6736(17)32154-2.

Impact of ivermectin on onchodermatitis



Fig 1. Onchocercal depigmentation.

Two cross-sectional surveys were performed at baseline and after six years of annual community-directed treatment with ivermectin (CDTi) in Anfilo district, western Ethiopia, an area hyperendemic for onchocerciasis. A total of 1114 individuals \geq 15 years of age were examined at baseline and 971 subjects \geq 15 years were assessed in the post-intervention phase. The authors found a statistically significant



Fig. 2 Hanging groin.

reduction of 45.6% in the prevalence of positive skin snips (74.8% vs 40.7%). Furthermore the prevalence of pruritus, onchocercal depigmentation, onchocercal nodules and hanging groin reduced by 54.4%, 61.3%, 77.7% and 88.5% respectively.

Samuel A, Belay T, Yehalaw D et al. Impact of six years community directed treatment with ivermectin in the control of onchocerciasis, western Ethiopia. *PLoS ONE* 2016; **11**:e0141029. doi:10.1371/journal.pone.0141029.

Moxidectin

Moxidectin is a more effective microfilaricidal agent for onchocerciasis than ivermectin. In a randomised, controlled, double-blind trial in four study sites in Ghana, Liberia and the Democratic Republic of Congo, the results were analysed in 947 participants who had received a single oral dose of 8mg moxidectin and 480 participants treated with 150 μ g/kg ivermectin. Skin microfilarial densities were significantly lower after moxidectin than after ivermectin and the percentage of subjects with undetectable microfilariae in the skin was significantly higher after moxidectin than after ivermectin 18 months post-treatment. There were no serious adverse events related to treatment. Previous mathematical modelling has suggested that the number of years to reach potential thresholds for onchocerciasis elimination with annual moxidectin is similar to using ivermectin every six months. Moxidectin now has US Food and Drug Administration approval for onchocerciasis in adults but a paediatric formulation is still needed. Further research will hopefully clarify the optimal use of moxidectin in community-wide treatment.

Opoku NO, Bakajika DK, Kanza EM et al. Single dose moxidectin versus ivermectin for *Onchocerca volvulus* infection in Ghana, Liberia, and the Democratic Republic of Congo: a randomised, controlled, double-blind phase 3 trial. *Lancet* 2018; **392**: 1207-16. [http://dx.doi.org/10.1016/S0140-6736\(17\)32844-1](http://dx.doi.org/10.1016/S0140-6736(17)32844-1).

MEETING HIGHLIGHTS: Dermatology for Africa at the Combined DSSA and ASDV Congress, Durban, August 2018



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The 2nd African Society of Dermatology and Venereology (ASDV) congress was held in conjunction with the 50th National Congress of the Dermatology Society of South Africa from the 30th August – 2nd September 2018 at the Durban ICC which is located at the Durban's Golden mile, a melting pot of cultures, on the east coast of South Africa.

The ASDV 2018 was the first African Dermatology congress to be held in South Africa and was a resounding success, attracting dermatologists from more than 20 African countries. This was the 2nd ASDV congress, the first was held in Abuja, Nigeria in 2016. There were about 500 delegates and more than 25 international and well renowned speakers from all over the world, a real coup for South Africa. The congress focused mainly on skin conditions that are prevalent in Africa, with an inclination towards skin of colour and infectious diseases. A myriad of exciting topics and workshops were geared towards dermatologists in academia, private and public sectors. The mandate of the combined meetings is to advance the specialty of dermatology in Africa, to promote the highest standards of clinical practice, disease control programmes, and collaborative research in dermatology and to influence policy development in the African region.

Congress highlights

Ethnic Skin and Hair

Numerous basic science and applied projects on African hair and skin conducted by L'Oréal research and development, shared results on the diversity of hair shapes as well as identifying specific biologic patterns of African frizzy hair, in an attempt to explain its extreme fragility.

We had for the first time in the history of dermatology in Africa the first "hands on" Hair workshop, with diverse speakers from Africa, North America and Europe. This was the most popular pre-congress hands on workshop with more than 100 attendees.

The treatment of pseudofolliculitis barbae (PB) poses a challenge particularly amongst men who have to maintain a clean shave due to social expectations. Contrary to popular belief, it has been shown that using a one blade shaving razor has no significant difference compared to using a five blade razor on triggering PB. In addition it



Prof Ncoza Dlova pays tribute to Prof Gail Todd for her major contribution to the development of dermatology in Africa.

is recommended to shave daily rather than 2-3 times per week if one aims to minimize recurrence of pseudofolliculitis barbae. Chemical depilators are preferred for shaving than using razors.

Another presentation discussed the impact of using artificial hair extensions on natural African hair for hair grooming and showed that this practice causes fracturing and damage to the hair shaft. The recommendations of the study were not to use artificial hair extensions for more than two months in a year.



Executive members of the African Women's Dermatology Society (AWDS), wearing colour coded African attire. From left to right: Dr Sian Hartshone, Dr Sarina Drusinsky, Prof Anisa Mosam, Prof Ncoza Dlova, Dr Suretha Kannenberg, Dr Dagmar Whittaker, Dr Antoinette Chateau, Dr Pholile Mpofu.

Medical Dermatology

There were interesting symposia that addressed therapy of conditions with a particular relevance to Africa. One of these was the use of biologics for Psoriasis and Hidradenitis suppurativa in Africa. The session was a practical guide to new therapies for these debilitating conditions.

In addition the congress hosted and supported an initiative by dermatologists across Africa to come together and form a registry for Severe Cutaneous Drug reactions, named AfriSCAR. This initiative was supported by Dr Elizabeth Phillips (USA) who spoke on "Understanding immunopathogenesis to fuel prevention of severe cutaneous drug reactions" and is particularly relevant in Africa with the high incidence of HIV and Tuberculosis.

Skin cancers were another buzz word at the congress with talks on cancer in patients with Albinism, Xeroderma pigmentosum and melanoma in Blacks. A session on the use of daylight PDT as a feasible option for patients in Africa and specifically those with Albinism was chaired by Wolfgang Philipp-Dormston from Germany.

There was excellent representation with talks on infectious dermatology from a variety of countries in Africa. An interesting talk on Pellagra emerging due to INH prophylaxis and one describing "Onyalai" as a new African disease were both presented by Malawian speakers. A talk on the challenges with treatment of chromoblastomycosis in Madagascar was certainly well received as the difficulties with therapy are experienced in many other countries in Africa. A talk on onchocerciasis as a neglected tropical

disease put into perspective the scale of the problem while one on Leprosy and the missed opportunities in making the diagnosis, especially in an era of elimination were quite alarming.

Aesthetics, Surgery and Vitiligo

The Combined Congress Dermatology for Africa brought together dermatologists from Africa and the world with special interests ranging from ethnic hair, pigmentation disorders to surgical expertise in scar and keloid management to vitiligo.

Pre-congress workshops in Vitiligo and Practical Aesthetics for the Dermatologist were well attended. The vitiligo workshop showcased all the available surgical techniques for the management of vitiligo. Experts in these techniques discussed and demonstrated the creation of suction blisters, the injection of trypsin into suction blisters, the preparation of cellular graft and the transfer to vitiligo sites. The transfer of hair follicles to vitiligo sites was also included as well as a discussion and use of laser techniques in treating vitiligo.

The use of cosmetic products and how to correctly advise patients on which products would be appropriate to use for their skin type was presented and discussed in the SASDS (South African Society for Dermatologic Surgery) pre-congress workshop as well as practical chemical peels and microneedling, followed by practical demonstrations.

The Aesthetics Session provided a wonderful platform for discussing the approach to all ethnic skin types. An examination

Continued overleaf...

and interpretation of specific features of the Indian face and incorporating the use of fillers when treating patients with ethnic skin types was discussed. Understanding how the younger generation picture themselves and how we need to adjust our aesthetic treatment plans in order to gently enhance features were also discussed. Disorders of pigmentation especially melasma and the treatments of many of the disorders of pigmentation were discussed in many sessions during the congress. Understanding more of the pathophysiology of the disorders of pigmentation enables therapy to be more effective and focused.

International as well as local experts discussed many surgical topics, from facial melanoma, surgical closures in difficult sites to squamous cell carcinomas. Mohs microsurgery experts from South Africa, America and Tanzania gave wonderful insights into the programmes offered in each country and how even in fairly rural settings world class treatments can be offered.

A workshop on the treatment of scars discussed all available techniques of management followed by live demonstrations using surgical techniques and laser therapy.

A special session for all dermatology residents/registrar highlighted simple surgical techniques with amazing tips on removal of lesions such as cysts and lipomas.

The final session brought all the experts together with wonderful discussions on controversies in the use of sunscreens, fillers and injectables. Surgical controversies with practical advice gave delegates take-home messages such as using adrenalin in lignocaine and how to inject local anaesthetic.

Some of the firsts for this congress were: scholarships given to 9 local medical students to attend the congress and in so doing exposing them to dermatology as a potential area of specialisation early in their careers; secondly at least 13 scholarships were created for dermatologists and residents from Africa to attend the meeting and in so doing ensuring that we had representations from as many regions in Africa as possible. Last but not least there was the screening of a documentary "A Gentle Magic" which addresses the problem of the use of skin-lightening creams in Africa.

The president, Prof Ncoza Dlova and deputy president and chair of scientific committee, Prof Anisa Mosam as well as the scientific chair of the SASDS, Dr Sian Hartshorne were very pleased with the outcome of the congress and are grateful to their team members; Dr Ayesha Akinkugbe, Dr Percy Naidu, Dr Nokubonga Khoza, Dr Kiasha Govender, Dr Khanyi Dladla, Dr Patiswa Nombona, Dr Noufal Raboobee and Dr Ndo Ngcobo for their contribution in making the congress the success that it was, as well as the industry for supporting the congress.

HIV-RELATED KAPOSI'S SARCOMA

Knowledge and Attitudes of Care and Treatment Centre (CTC) Healthcare Workers in Arusha, Tanzania

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Abstract

Kaposi's Sarcoma (KS) is the second largest cancer burden in Tanzania; its greatest risk factor is HIV. However, there is only one cancer centre nationally and there is no government guidance regarding management of KS in national HIV Care and Treatment Centres (CTCs). This article investigates knowledge of and attitudes towards HIV-related Kaposi's Sarcoma among CTC healthcare workers in Arusha, Tanzania, to see whether they are equipped with adequate knowledge to diagnose and manage KS. Results show levels of knowledge overall are low, with healthcare workers requesting further education about KS.

Background

Kaposi's Sarcoma (KS) is a tumour caused by Human Herpes Eight Virus (HHV-8)¹. It manifests as skin and mucosal lesions; when advanced, KS appears on internal organs which can be fatal².

Human-immunodeficiency virus (HIV) is the greatest predisposing risk factor to KS. Anti-retroviral therapy (ART) is an effective first-line treatment for KS, combined with chemotherapy if advanced³, however, Sub-Saharan Africa (SSA) has the lowest access globally to ARTs⁴.

KEY WORDS

Kaposi sarcoma, human immunodeficiency virus, health education, Tanzania

In 2012, HIV was the leading cause of death in Tanzania⁵. KS is the most common HIV-related malignancy and second most prevalent cancer in Tanzania – 11.9% of all cancers⁶. HHV-8 has an estimated prevalence of 50% in the population⁷ – showing KS's large burden and growth potential.

Basic KS management is mentioned in the 2012 National Health Guidelines for HIV/AIDS⁸, however many treatment options are unavailable in resource-poor settings (where most cases occur)⁹.

There is one cancer centre nationally, in Dar es Salaam¹⁰, where advanced KS patients are referred. There is no literature investigating KS knowledge of healthcare workers working within CTCs.

The discrepancy between high burden of disease and limited evidence of treatment distribution needs investigation to understand how equipped CTC healthcare workers are to diagnose and treat KS.

Aim

To investigate knowledge of HIV-related Kaposi's Sarcoma and its application in CTC healthcare workers in Arusha, Tanzania.

Objectives

1. Assess whether healthcare workers are aware of KS as a HIV-related condition by exploring their knowledge of HIV skin complications
2. Determine their knowledge of aetiology, diagnosis and treatment of KS
3. Explore their application of knowledge through individual responses to clinical scenarios

Methods

Data were collected in a 'mixed methods' approach – a quantitative cross-sectional knowledge questionnaire and qualitative clinical scenario vignettes.

Interviews were undertaken in a private room with the researcher and an interpreter present. A structured questionnaire, available in English and Kiswahili, comprised the first half of the interview. The first section concerned demographics, followed by skin complications of HIV (objective 1) and KS – aetiology, diagnosis and treatment (objective 2).

The second half of the interview comprised three clinical scenarios exploring ethical issues, advanced KS, and differential diagnoses (objective 3).

Research was performed in May 2017 in Arusha, Tanzania. Ethical Approval was received from University of Leeds, the Tanzania National Institute for Medical Research (NIMR) and the Tanzania Commission for Science and Technology (COSTECH).

Data Analysis

Statistical tests such as mean, standard deviation and Fisher's exact binomial test (due to small sample size¹¹) were applied to the quantitative questionnaire responses.

Clinical discussions were transcribed and combined with interview notes to increase credibility¹². These were analysed using a framework approach and thematic content analysis.

Results

Quantitative Findings

Demographics

In total, there were 12 participants – 4 males and 8 females. Table 1 shows healthcare workers grouped by profession and Table 2 shows their distribution by urban/rural working location.

Table 1. Healthcare Worker Profession by Sex

Profession	Number of Males		Number of Females		Total Number of Adults	
	Freq.	%	Freq.	%	Freq.	%
Nurse	0	0	6	75	6	50
Doctor	3	75	2	25	5	41.7
Other	1	25	0	0	1	8.3
Total	4	100	8	100	12	100

Table 2. Healthcare Workers Work Location by Profession

Majority location of work	Number of Doctors	Number of Nurses	Number of Adults	Number of Adults
Urban	2	1	1	4
Rural	0	0	0	0
Equal Urban/Rural	3	5	0	8

Overall Knowledge Scores

Out of a maximum of **24**, mean score overall was **10.4** (confidence interval (CI) 7.9-13.2). The doctors' mean score was **12.6** (CI 8.2-17), nurses' was **9.3** (CI 5.3-13.3) and other healthcare workers' was **6** (CI 0-15.8). Table 3 demonstrates a significant relationship between achieving a score above the mean and being a doctor (versus nurse or other practitioner; Figure 1 shows distribution of scores by profession. Work location had no significant relationship to overall score (Table 4).

Table 3. Relationship between Profession and Overall Score

Score	Doctor		Non-Doctor	
	Freq.	%	Freq.	%
Above Mean score	5	100	2	28.6
Below Mean score	0	0	5	71.4
Total	5	100	7	100

Fisher Exact Test p-value = 0.0278

Figure 1. Overall Score Distribution by Profession

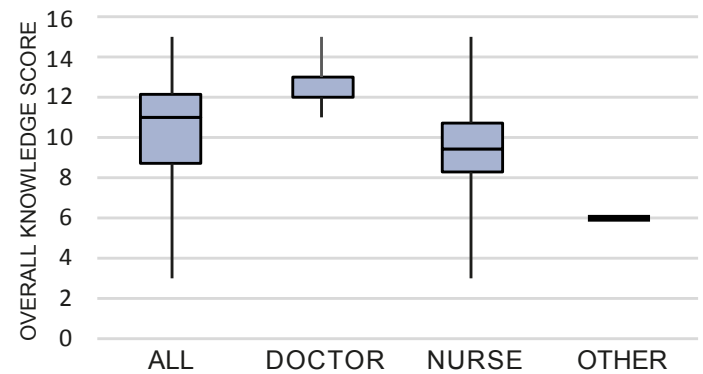


Table 4. Relationship between Work Location and Overall Score

Score	Urban		Equal Urban/Rural	
	Freq.	%	Freq.	%
Above Average	2	50	6	75
Below Average	2	50	2	25
Total	4	100	8	100

Fisher Exact Test p-value = 0.5475

Skin Complications of HIV

The maximum score for this section was **5**, the mean score was **2.3** (CI 0-5). Distribution of correct answers by profession are shown in Figure 2 (overleaf). There is no statistical significance between profession and score.

Disease-Specific Knowledge

The relationship between profession and KS knowledge score is statistically significant, the Fisher exact test p-value is 0.028.

Five participants (41.7%) were able to correctly describe KS lesions. Figure 3 (overleaf) shows distribution of answers. First-line treatment of KS was identified correctly by 66.7% of participants. When asked about treatment for advanced KS, correct answers were only given by 5 participants (41.7%), 4 of whom were doctors. Worryingly, 50% of nurses believed herbal medicine was most suitable.

Continued overleaf...

Figure 2. Correctly Selected Answers for HIV-related Skin Complications

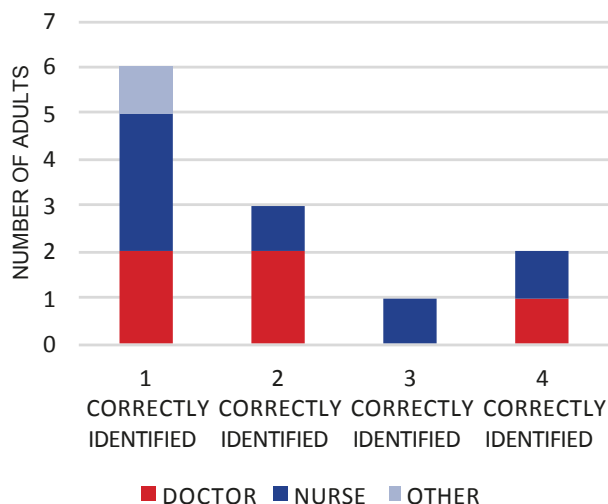
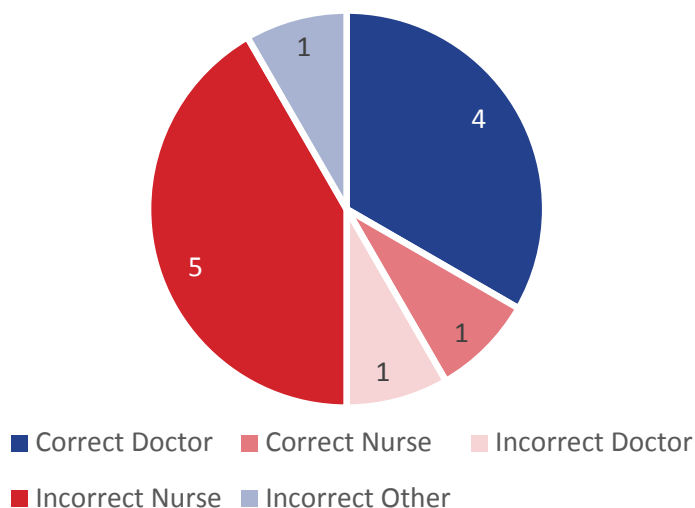


Figure 3. Distribution of answers: KS Lesion Description



KS Management in Tanzania

When asked how management could be improved, 58.3% of healthcare workers suggested more public education, 50% said better education of themselves and 58.3% said treatment improvement (participants could give multiple responses).

Qualitative Data

Scenario 1

This focussed on initial presentation of KS in a patient with pre-existing HIV who had visited a traditional healer. The first topic discussed was HIV management. Anti-retro virals (ARV) use was asked by 5 participants; counselling on safe sex was suggested by 6. Visiting a traditional healer was an issue raised by 7 participants: *"It is very stupid of Agnes (patient) to visit the traditional healer."*

The next topic discussed was diagnosis and management of KS. Biopsy was suggested by 2 healthcare workers. Incorrect treatment was suggested by 2 participants, 5 suggested referrals to a dermatologist.

Scenario 2

This involved a patient who was concerned about HIV and had an unclear diagnosis (KS or thrombocytopenic purpura). All participants wanted to perform an HIV test and counselling.

The next topic discussed was differential diagnoses. 5 participants thought the patient definitely had KS, 2 thought it may be that or another cancer. 6 participants considered another opportunistic infection; only 1 doctor correctly identified thrombocytopenic purpura.

Regarding diagnosis and management, visual diagnosis was suggested by 4 participants, 2 of whom would also perform a biopsy (recommended by 7 participants in total).

Scenario 3

This involved a patient with a recent AIDS diagnosis, and purple spots on her body.

The first topic discussed was HIV management. Investigating the patient's CD4 levels was suggested by 9 participants. 6 wanted to investigate secondary symptoms.

Biopsy was the most commonly suggested method of diagnosis, chosen by 10 participants, although 2 CTCs did not have capacity for performing biopsies; 4 participants wanted to refer to a dermatologist.

Common Themes

The first common theme was participants' perception of their own knowledge being insufficient – 8 participants believed this:

"I do not know how to treat this patient. I do not have enough knowledge"

"I would feel very uncomfortable if I was asked to treat someone with KS"

Secondly, participants focussed on treatment and management of HIV for each scenario, with the majority of answers relating to this, not KS.

Discussion

Findings will be discussed and compared with existing research. Research will be used from dental students as no studies have been performed on other healthcare workers' knowledge of KS. Dental students are expected to know about KS in terms of its oral manifestations¹³, so some comparisons can be drawn.

Skin Complications

Although general knowledge of HIV-related skin conditions was poor, all participants were able to identify KS as a complication. However, this study was performed on only 12 participants, so results may not be as reliable.

Globally, studies on dental students are similar – in Brazil, knowledge of association between HIV and KS was 92.5% and in Iran, 93.8%^{13,14}. These studies took place in middle-income countries among dental students, so their comparability to Tanzanian HCWs may be limited.

Nigerian dental nursing students were shown to lack in-depth knowledge regarding HIV and its oral complications¹⁵. Both studies took place in SSA making the countries more comparable. However, Nigeria has lower rates of HIV which may affect knowledge, and the study was again performed on dental students.

This demonstrates the need for further education among CTC healthcare workers. Large-scale studies would increase reliability of results.

Kaposi's Sarcoma

Knowledge of KS was low among all, although doctors achieved significantly higher results. This is perhaps because doctors receive

higher levels of education. Furthermore, doctors are more likely to see patients with KS, as 'complicated' HIV patients are referred to them by nurses⁸. Greater exposure to KS may increase knowledge.

A lack of in-depth knowledge among all professions was demonstrated by 75% of participants not knowing KS's causative organism. The high frequency of selection of ARV for first-line treatment of KS may be due to it being the most commonly used CTC drug⁸.

Regarding treatment of advanced KS, 80% of doctors correctly identified chemotherapy. Although 50% of nurses answered correctly, the remaining 50% suggested herbal medicine – this could be detrimental to patients.

There are no studies regarding healthcare workers' knowledge of KS globally.

Participants' knowledge gaps may lead to new cases of KS going unnoticed, especially as most consultations are performed by nurses⁸ (who had generally worse knowledge). This knowledge deficit needs to be addressed to reduce the burden of KS.

Clinical Application of Knowledge

In general, performance in clinical scenarios mirrored theoretical knowledge of KS. In scenario 2, when asked to suggest a differential diagnosis, 50% suggested 'general' opportunistic infections but were unable to name them. Furthermore, only doctors were able to distinguish symptoms of KS. This lack of detailed knowledge was mirrored in quantitative data, particularly among nurses (majority of CTC workforce⁸).

Nurses focussed on monitoring HIV, perhaps because this was an area of expertise. However, when presented with a patient with KS, it is likely that most nurses would not be able to identify or manage the disease. This calls for better education so KS can be correctly diagnosed and managed.

Conclusion

Despite healthcare workers being aware of KS as a complication of HIV, in-depth knowledge was lacking in many participants, particularly nurses who are at the front-line of HIV treatment. Particular gaps existed in causes, presentation and treatment of KS. Education for HCWs and public health campaigns should be prioritised, and CTCs should provide basic screening and care for KS in order to reduce its disease burden.

Acknowledgements

I want to thank Professor Timothy Ensor for his support, everyone at CEDHA in Arusha, namely Dr Masatu and Dr. Kini for welcoming me and my research assistant Christina Renatus for her help translating.

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ISSN 1743 - 9906

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