The Many Languages of Skin Health

By Amanda Iverson Tschetter, MD; Janet C. Lindemann, MD, MBA

Introduction

No matter the culture or language, it is often our skin that unites and sometimes divides us. Suntanned skin in a teenager may be both attractive and dangerous. In another culture, a fungating foot ulcer may raise inordinate fears of leg amputation. An erythematous scaly eruption on a child in the developing world may bring shame on his parents for their perceived inability to provide adequate nutrition. Dermatologic concerns span all cultures.

For a medical school education project, I chose to focus dermatology education on three different patient populations. Based on the theory that visual cues can both educate and motivate individuals in their understanding of skin health, I developed three educational aids targeted to the following populations: nutrition-related skin diseases for the people of Malawi, the risks of ultraviolet (UV) skin tanning for young people in South Dakota and the prevention of diabetic foot ulcers for people of Native American heritage. The aim across all three populations was to motivate individuals to seek treatment and to develop healthy habits. "Eating Healthy Malawi" is a poster that uses photos and simple language to convey nutritional deficiency disease entities and the foods containing each of the lacking nutrients. "SKINmission" is a social media site designed to increase awareness of the harmful effects of UV light exposure with a target of decreasing tanning salon use among Caucasians. "Diabetic Wound Care" is a poster for Native Americans in South Dakota that uses photos for education on diabetic foot ulcer treatment and prevention. The project was part of the Sanford School of Medicine Scholarship Pathways Program, an extracurricular track intended to promote scholarship and leadership skills.

Background and Methods

Nutritional Deficiencies in Malawi

My project began between my first and second years of medical school when I traveled to Lilongwe, Malawi, in sub-Saharan Africa to learn from physicians and patients at the Baylor College of Medicine-Abbott Fund Children's Clinical Centre of Excellence, a pediatric HIV clinic in the country's capital. The idea to develop a poster for Malawians on the cutaneous manifestations of nutritional deficiencies came at an outreach clinic at Mzuzu where I saw a man with pellagra, a disorder caused by a deficiency of niacin. The country of Malawi is home to over 14 million people (2008), 930,000 of whom are living with HIV/AIDS (2007).[1] With an HIV/AIDS prevalence rate of 11.9 percent for adults (age 15-49 years), Malawi ranks ninth in the world for adults living with HIV/AIDS.[2] Malnutrition and HIV are two of the most common causes of childhood morbidity and mortality in this country[3] where the prevalence of child stunting is 58.0 percent.[4]

Malnutrition includes kwashiorkor, a deficiency in protein energy. Over 20,000 Malawian children each year are treated for protein deficiency or kwashiorkor.[5] One study of a population affected by drought found the prevalence of kwashiorkor to be 2.5 percent in children 1 to 3 years of age.[6] Kwashiorkor is the predominant form of severe malnutrition in Malawi, and the case fatality rate for children with the illness is between 20.0 to 49.0 percent.[7]

A second nutritional problem, vitamin A deficiency (VAD), increases all-cause mortality. VAD is defined as a serum retinol <0.70 μmol/L or the presence of abnormal impression cytology. In 2000, VAD prevalence was estimated at 32.0 percent, affecting a staggering 33 million children under age 5 across Africa.[8] Xerophthalmia, a manifestation of VAD, occurs when the cornea keratinizes and becomes opaque and the eyes feel very dry. Xerophthalmia increases the eye's susceptibility to infection[9] and affects 1.5 million Africans.[8] The prevalence of VAD among Malawian children ages 6 to 36 months is approximately 60.0 percent.[8]

A third problem is zinc deficiency. A study of rural pregnant Malawian women revealed that 36.0 percent had suboptimal plasma zinc levels, and 46.0 percent had low hair zinc values. Risk factors for zinc deficiency include poorly available dietary zinc, frequent reproductive cycling and high malaria prevalence.[10] Similar population statistics exist for nutritional deficiencies in niacin (pellagra) and vitamin C (scurvy).

Educational Poster for Malawi

"Eating Healthy in Malawi" (EHM) is a poster addressing five diseases: phrynoderma (vitamin A deficiency), pellagra (niacin deficiency), scurvy (vitamin C deficiency), kwashiorkor (protein deficiency) and acrodermatitis (zinc deficiency). Given an adult literacy rate of 72.0 percent in this country,[11] the poster visually presents the disease caused by the deficiency linked with the foods containing the nutrients needed to correct the deficiency. Photographs to demonstrate the dermatologic manifestations of each disease were obtained and simple language was used to describe other systemic signs and symptoms of each disease. To communicate the nutrients needed to cure a deficiency, photographs overlaid with each corresponding name were used. Foods were chosen using input from native Malawians and an American missionary to Malawi, based on availability and affordability to the average native. The poster was then translated into Chichewa, the local language in Malawi. The final poster (see Figures 1 and 2) is currently on display in five locations across Malawi (See Figure 3). Three of the locations are in Lilongwe: the Baylor Clinical Centre, Kamuzu Central Hospital and Partners in Hope, an HIV testing and adult treatment facility. Mzuzu and Zomba Central Hospitals also display the poster.

Skin Damage from Ultraviolet Tanning

The National Cancer Institute has reported that melanoma rates among white women ages 20 to 49 have more than doubled between 1975 and 2007, and the American Academy of Dermatology as well as the Skin Cancer Foundation conclude that tanning device use is linked to this rise.[12] Risk of melanoma development increases with the number of sessions, hours and years of tanning bed use. Indoor UV tanning makes the user 74.0 percent more likely to develop malignant melanoma in his or her lifetime, and the years of tanning device use has the greatest correlation

FIGURE 1. Eating Healthy Malawi poster translated to Chichewa.

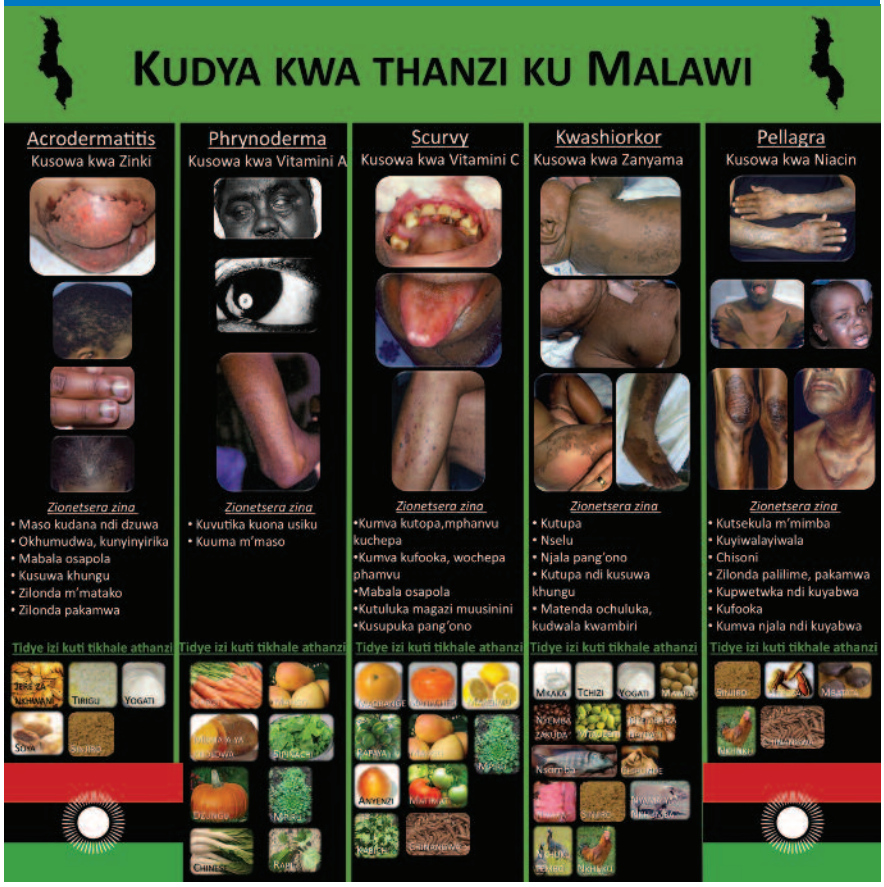


FIGURE 2. Nurse Atide Matunga by EHM poster displayed in Children's Medical Ward C for malnourished patients at Kamuzu Central Hospital in Lilongwe, Malawi.

FIGURE 3. Map of Malawi with black arrows to indicate where EHM posters are displayed.

with melanoma development.[13] There are 55 tanning salons in the 13 largest cities across South Dakota.[14]

My concern about this skin issue is confirmed by a recent discovery that the phrase "GTL.", signifying "Gym, Tan, Laundry," is defined as "the process of staying fresh and mint."[15] This all-too-commonly heard phrase uttered by the mouths of my generation was coined by the regrettably famous reality television show "Jersey Shore". The GTL lifestyle places adolescents at a much higher lifetime risk for cutaneous melanoma, as the International Agency for Research on Cancer has declared tanning devices to be carcinogenic.[13] When talking with peers, their reasons for use of an UV tanning device are numerous and include, but are not limited to, "My acne is better when I'm tan," "It cheers me up in the winter," "I feel slimmer with a tan," and "It just makes me feel better about myself."

SKINmission Blog

According to marketing data, a targeted advertisement on Facebook has remarkable potential to reach the residents of South Dakota. Based on population estimates, a Facebook advertisement targeting South Dakotans ages 13 to 30 has the potential to reach over 200,000 users.[16] As a product of a social media-savvy generation, I felt it imperative to my future as a physician to learn to communicate with the general public through social media outlets. With a generation of adolescents and young adults visiting tanning salons tri-weekly and obsessively checking Facebook, it seemed appropriate to create a blog about skin health. A blog is a website containing an ongoing chronicle of information usually presented as a list of entries in reverse chronological order. It often features links to articles or other websites.

The logic behind SKINmission.blogspot.com (see Figure 4) is to provide evidence-based advice on overall skin health with the aim of decreasing tanning device use by Caucasian Americans. Steady encouragement for sunscreen use and discouragement of tanning device use make up only a portion of the blog topics. Other topics include oral nutrition for skin health, education on active ingredients in acne and anti-aging skincare products as well as posts on melanoma, dry skin and warts. Educating teenagers on skincare to prevent and heal acne may improve self-confidence enough to allow them to avoid UV tanning devices. Appealing to the vanity of young adults by educating them that accelerated skin aging is guaranteed with UV tanning device use may be the tipping point to keep them out of UV tanning salons.

Diabetic Foot Ulcers Among Native Americans

Diabetes mellitus (DM) is responsible for the largest number of non-traumatic amputations in the United States,[17] and diabetic foot ulcers (DFUs) are a major risk factor preceding 85.0 percent of amputations in patients with diabetes in the United States.[18] American Indians and Alaska Natives (AIAN) are 2.3 times more likely to have diabetes than are individuals in the U.S. general population,[19] and the rate of diabetes is over three times higher among American Indian adults than among U.S. adults of any other race.[19] Health disparities among Native Americans are extensive when compared to U.S. adults of other races: the rate for amputations among American Indian adults is greater than 10 times that of U.S. adults with an American Indian prevalence rate of lower extremity amputation at 1.8 percent.[19]

FIGURE 4. Screen capture of SKINmission.blogspot.com.

Unfortunately, the morbidity burden among American Indians with DM exceeds that of insured U.S. adults with DM by 50.0 percent, and the mortality due to DM among AIAN is over four times higher than that of the U.S. general population.[19] The best management of diabetic foot ulcers is prevention,[17] as cure rates are highly variable, ranging from 20.0 to 47.0 percent in most clinical trials.[20] Increasing patient and physician awareness for prevention and early intervention is critical as any delay in

treatment leads to a decreased likelihood of cure.[18]

Educational Poster for the Pine Ridge Indian Reservation

During one week of my third year of medical school aimed at enhancing cultural diversity, I spent two days with podiatrists on the Pine Ridge Indian Reservation. My attention was drawn to the importance of podiatric specialty care for the prevention of lower extremity amputations in this high-risk population, and I began searching for a way to contribute. I developed a poster with two aims: to raise awareness of the signs and symptoms of DM, and to highlight the diabetic foot ulcer as a risk factor for lower extremity amputations in order to promote compliance with wound care treatment plans.

The educational poster "Diabetes & Wound Care" (D&WC) (see Figure 5) is divided into three sections: "Diabetes," "Wounds," and "Care." Modeled on the same principles as "Eating Healthy Malawi," D&WC uses multiple images as well as straightforward language to enhance the educational value of the poster. The "Diabetes" section defines diabetes mellitus, lists the possible consequences of the disease, describes early symptoms, and pictures two possible dermatological signs of DM: diabetic dermopathy and acanthosis nigricans. Diabetic dermopathy or "shin spots," occurs on the lower legs of almost half of those with diabetes.[17,21] Acanthosis nigricans, while not specific to diabetes, is commonly found on the skin of persons with endocrine disorders.[17,22]

In the second section, labeled "Wounds," multiple diabetic foot ulcers (DFUs) are pictured along with a list of the risk factors for amputation. Also featured via photographs is the chronicle of one man's progression from DFUs to ultimate bilateral below the knee amputations. The third and final section, "Care", gives tips on good practices for prevention of DFUs, pictures of proper diabetic shoes with description on use, encourages seeking early treatment of DFUs and lists the most current treatment options for DFUs.

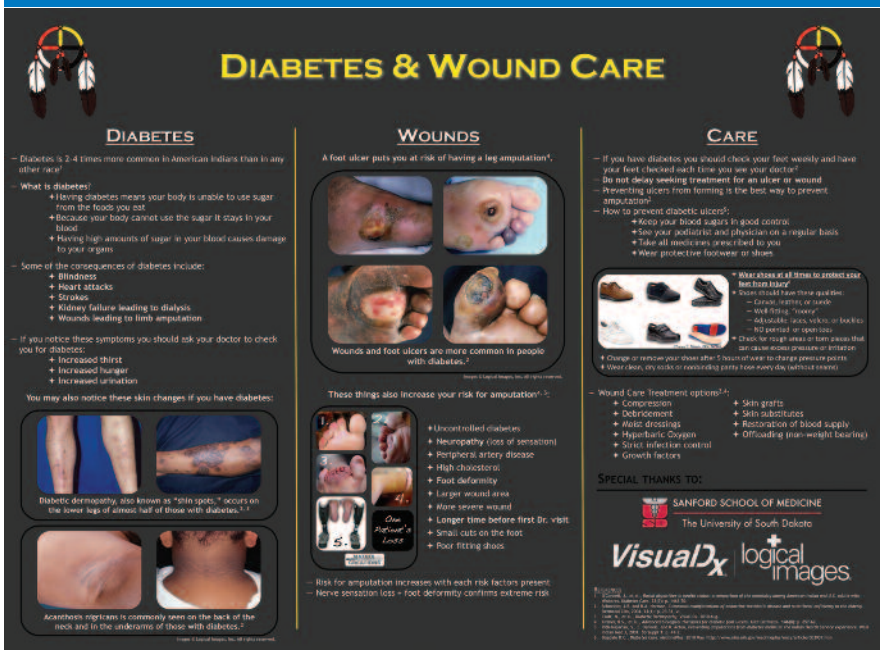
Photographs of wounds and amputations are often viewed as graphic. The intent of inclusion of such images in D&WC was not to shock, but rather to alert the patient to the possible consequences of poorly controlled DM with the hope of encouraging patient compliance. The target audience will be reached by displaying the poster outside of the podiatry clinic at the main hospital in the town of Pine Ridge as well as at the podiatry clinic in Kyle, S.D., also on the Pine Ridge Reservation.

Results and Discussion

The impact of the nutrition and skin health posters in the African country of Malawi remains to be determined. Initial indications are that Malawians who have viewed the posters understand the content. There have been requests for additional posters as well as for the creation of other visual materials. The SKINmission Blogspot has received over 10,000 hits and has 381 Facebook likes to date. The Diabetes & Wound Care poster was well received by the Pine Ridge podiatrists, one of whom personally called stating her hopes for future dermatologic-podiatric collaboration on the reservation.

Throughout the development of this project there have been certain lingering questions pertaining to each section. Regarding the Eating Healthy Malawi poster: do Malawians incorrectly read the poster as meaning the foods pictured could cause the disease shown; could this poster cause any harm; is the poster too graphic; and will it be useful? Concerning the SKINmission Blogspot: are multiple generations open to health information via the Internet and social networking sites; is the intended audience interested in evidence-based medical advice; and how can the writer stay relevant in blogging about health to keep the readers interest piqued? In regard to the Diabetes & Wound Care poster: does the target population find motivation knowing the possible outcomes of poorly controlled diabetes mellitus and diabetic foot ulcers;

FIGURE 5. Diabetes and Wound Care poster.



would this poster make even one reader "give up" on fighting to prevent amputation; and would the reader benefit more by viewing encouraging or fright-inducing images?

Conclusions

There are many ways to educate people about skin health, even across major socioeconomic divides. *Dermatology Across Cultures* achieved its goal of disseminating culturally sensitive and specific information to three different populations using two forms of communication: social media and print media. The project effectively demonstrates the process of tailoring information to target three diverse cultures: Malawians, Caucasian Americans aged 13 to 30, and Native American diabetics. Time along with further feedback from Malawi and Pine Ridge will determine whether or not visual cues truly aid in patient education and motivation. The pattern of the SKINmission Blogspot page views is encouraging as the number of daily hits continues to grow as the blog adds content and receives more publicity. Entries from the blog will also be reposted on the consumer health counterpart to VisualDx®, SkinSight.com, where I have been asked to become a regular contributor. SkinSight.com receives over 600,000 hits monthly.[25]

My Scholarship Pathways project has possibly influenced me more than it has taught each target audience. Time spent on the project allowed me to creatively merge my interest in dermatology with my personal goals of educating my generation and reaching out to underserved cultures. My improved understanding of patient education and cultural sensitivity will greatly benefit me as a physician. I intend to expand each component of this project in some capacity throughout my residency and into my career as a future dermatologist.

At the end of medical school, I completed a six-week dermatology rotation in Botswana, where I learned culture from the Batswana and tropical dermatology from U.S. dermatology residents. This rotation is open to American and Canadian senior dermatology residents and is made possible by the Resident International Grant[24] through the American Academy of Dermatology. I would love to apply for this grant as a senior dermatology resident and return to Botswana to continue my involvement with skin health education in Africa. My goal for the SKINmission Blogspot is to convert it to a fully integrated and evolving website to be used as an educational tool for my future patients along with continuing its initial intent of educating many through social media resources. Finally, I hope to bring dermatology services to the Native American reservations of South Dakota through clinical outreach and telemedicine. There is promise in the use of telemedicine to improve wound care[26] and this is a particular area of research I would love to contribute to during residency training and throughout my practice of dermatology.

REFERENCES

1. http://hivinsite.ucsf.edu/global?page=cr09-mi-00.
2. https://www.cia.gov/library/publications/the-world-factbook/rankorder/2155rank.html.
3. Fergusson P, K. Chikaphupha, et al. Quality of care in nutritional rehabilitation in HIV-endemic Malawi: caregiver perspectives. Matern Child Nutr. 2010 Jan;6(1):89-100.
4. Rico E, Fenn B, Abramsky T, Watts C. Associations between maternal experiences of intimate partner violence and child nutrition and mortality: findings from Demographic and Health Surveys in Egypt, Honduras, Kenya, Malawi and Rwanda. J Epidemiol Community Health. 2010 Sep 14.
5. Manary M. Protein-energy malnutrition: there is still work to do. J Pediatr Gastroenterol Nutr. 2001 May;32(5):519-20.
6. Courtright P, Canner J. The distribution of kwashiorkor in the southern region of Malawi. Ann Trop Paediatr. 1995 Sep;15(3):221-6.
7. Manary MJ, Brewster DR. Intensive nursing care of kwashiorkor in Malawi. Acta Paediatr. 2000 Feb;89(2):203-7.
8. Sanjoaquin MA, Molyneux ME. Malaria and vitamin A deficiency in African children: a vicious circle? Malar J. 2009 Jun 17;8:134.
9. Kliegman: Nelson Textbook of Pediatrics, 18th ed., Chapter 45 – Vitamin A Deficiencies and Excess, Maija Zile.
10. Gibson RS, Huddle JM. Suboptimal zinc status in pregnant Malawian women: its association with low intakes of poorly available zinc, frequent reproductive cycling, and malaria. Am J Clin Nutr. 1998 Apr;67(4):702-9.
11. http://www.unicef.org/infobycountry/malawi_statistics.html.
12. Indoor tanning is strongly linked to melanoma risk. Harv Womens Health Watch. 18(1): p. 7.
13. Lazovich, D., et al., Indoor tanning and risk of melanoma: a case-control study in a highly exposed population. Cancer Epidemiol Biomarkers Prev. 19(6): p. 1557-68.]
14. Dex and Google searches. Tanning Salons in: Sioux Falls, Rapid City, Aberdeen, Watertown, Brookings, Spearfish, Pierre, Mitchell, Yankton, Madison, Brandon, Huron, and Vermillion.
15. http://www.urbandictionary.com/define.php?term=GTL.
16. Facebook Marketing Advertisement Builder? Promotional advertisement.
17. Schneider JB, Norman RA. Cutaneous manifestations of endocrine-metabolic disease and nutritional deficiency in the elderly. Dermatol Clin. 2004 Jan;22(1):23-31, vi.
18. Krsner RS, Warriner R, Michela M, Stasik L, Freeman K. Advanced biological therapies for diabetic foot ulcers. Arch Dermatol. 2010 Aug;146(8):857-62.
19. O'Connell J, Yi R, Wilson C, Manson SM, Acton KJ. Racial disparities in health status: a comparison of the morbidity among American Indian and U.S. adults with diabetes. Diabetes Care. 2010 Jul;33(7):1463-70.
20. Kurd SK, Hoffstad OJ, Bilker WB, Margolis DJ. Evaluation of the use of prognostic information for the care of individuals with venous leg ulcers or diabetic neuropathic foot ulcers. Wound Repair Regen. 2009 May-Jun;17(3):318-25.
21. Craft, N., et al., Diabetic Dermopathy. Visual Dx. 2010 Aug.
22. Craft, N., et al., Acanthosis Nigricans, Visual Dx, 2010 June.
23. http://matrixcreations.net/effectsofdiabetes.htm.
24. http://www.aad.org/education-and-quality-care/awards-grants-and-scholarships/resident-international-grant.
25. Logical Images marketing administrator.
26. Bowling FL, King L, Paterson JA, Hu J, Lipsky BA, Matthews DR, Boulton AJ. Remote assessment of diabetic foot ulcers using a novel wound imaging system. Wound Repair Regen. 2011 Jan;19(1):25-30. doi: 10.1111/j.1524-475X.2010.00645.x. Epub 2010 Dec 6.

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