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Chewing stick use among African immigrants in West Philadelphia: implications for oral health providers

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Objectives: To explore tooth cleaning methods used by different groups of African immigrants residing in West Philadelphia and identify reasons for its continued use after migration to the U.S. ***Methods***: Interviews and focus groups facilitated by two dentists of African descent were conducted during two African health fairs held in West Philadelphia. A total of fifty immigrants representing 15 countries volunteered to participate. ***Results***: 100% of the participants used chewing stick in their home countries. 73% who continue its use after migration to the U.S. believe it is more effective as a tooth cleaning device and that it has medicinal value to the teeth, gums and body. ***Conclusion***: Use of chewing stick as an oral hygiene tool persists among different groups of African immigrants after years of residence in the U.S. Oral health providers need to be more aware of alternative health practices used among diverse groups in their communities and determine their value in oral health care.

Key Words: African immigrants, chewing sticks, dental care, oral hygiene.

Introduction

US demographics are rapidly changing as documented and undocumented minority immigrants enter the country each year. Between 1970 and 1990, the number of Africans living in the US grew five fold (Arthur, 2000). The proliferation of African immigrants in Philadelphia and other US cities is likely to continue as economic and security conditions continue to be uncertain in many African countries. A major concern is the high rates of non-insured in this group and their limited access to health care. This group bears a disproportionate burden of undiagnosed illnesses and frequently lack basic preventive care due to difference in language, culture, education system, inability to navigate the health system and lack of support (Loue, 1992). Many of them use emergency care with preventable conditions thereby overloading an already overburdened health system. On the other hand, immigrants bring with them health beliefs and practices that they have proven to be effective in their home countries and continue to use these in their new country. Among these is the use of chewing sticks as an important tool for oral hygiene care.

For centuries, chewing sticks have been used extensively for teeth cleaning in Africa, Middle East, Asia, South America and in isolated areas in the southern part of the United States (Wu *et al*., 2001). The long-established association of chewing sticks with oral and dental hygiene along with its therapeutic benefits, low cost, availability, as well as its usefulness for religious practices have allowed chewing stick use to endure through the ages. An additional benefit is the ease in preparation. Chewing sticks are prepared from roots, stems or twigs of a variety of local plants and shrubs in different parts of the world (Figure 1). Hattab (1997) reports that the most widely used chewing stick is Salvadora persica, a plant with wide geographical distribution spanning from India through Pakistan, Afghanistan, Iran, Iraq, Jordan, Egypt to Mauritania in the west, and from North Africa through Sudan, Ethiopia, Nigeria, Ghana and Tanzania to South Africa. Pencil-sized sticks called by different names (see Table 1) are chewed briefly at one end to fray the long tissue fibers in preparation for its daily use for cleaning the teeth, gums and tongue. The mouth cleaning process may last a few minutes or the chewing stick may be left in the mouth for extended time as the user goes about his work or runs errands. Its cleansing efficacy could be due to mechanical effects of its fibers, release of biologically active chemicals brought about by chewing, and enhanced salivation. Well controlled *in vitro* studies looking at effects of chewing stick extracts on growth and adherence of bacteria show that some of the plants contain substances that have antibacterial properties and inhibit adherence and growth of oral pathogens including Streptococcus mutans, porphyromonas gingivalis and prevotella intermedia (Cai *et al*., 2000). Extracts of some chewing sticks such as Fagara zanthoxyloides have been found to have anti-sickling activity of the red blood cells (Sofowora and Isaacs, 1971) while others have been reported to treat splenomegaly, rheumatism, tumors and renal stones in humans by folk medicine practitioners (Harfi *et al*., 1997).

Current studies on efficacy of the chewing stick frequently lack specific details regarding frequency, duration

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Figure 1. *Chewing stick*

Table 1. Country and local name of chewing stick

Country	*Local Name**
Cote d'Ivoire	Gbese
Ethiopia	Metaka
Gambia	Prenche, Sochu
Ghana	Kocha, Tswaipin
Guinea	Ghossorthe
Kenya	Mswaki
Liberia	Teri, Gbese
Mali	Gese
Mauritania	Comdossade
Namibia	Muthala
Niger	Kosse
Nigeria	Atu, Kpako, Pako, Ijebu, Ayan, Emigbegi, Meyinro, Orugbo
Saudi Arabia	Mswaki
Senegal	Sochu
Sudan	Mswaki
Tanzania	Mswaki
Togo	Alo, Senao
Zimbabwe	Mutiwam, Mazino

*One country may have more than one local name for chewing stick.

and times of their use, which prevents meaningful assessments of the mechanical cleaning effect of chewing sticks. Though researchers have used different chemical extraction techniques of active ingredients from chewing sticks, most have isolated the following components: tannins, sulphur, vitamin C, calcium, chloride, fluoride, saponins, trimethylamine, and resins (Almas, 1999). Tannins have been shown to have an inhibitory effect on bacteria implicated in periodontal disease (Homer *et al*., 1990).

We aimed to explore the use of chewing sticks as a tooth-cleaning device among a selected group of African immigrants residing in West Philadelphia, a neighborhood that is described as vibrant and diverse. This area is in close proximity to a major university center including a dental school and three health community centers. We also wanted to determine if the use of chewing sticks persists and identify reasons for its continued use even after the immigrants have resided in the US for several years. As communities in the U.S. become increasingly diverse, health care providers need to be culturally aware of the health habits and beliefs of the people they serve. Awareness and sensitivity to cultural factors affecting health, need to start in the health professions education where students are exposed and are made aware of the culture and practices of their patients. Information derived from this study may be useful in designing cultural competency courses for dental students, in planning for community outreach programs for dental schools and in assisting health care providers to become more aware of traditional cultural health practices among immigrant communities where they serve. There is no known study that has been conducted to investigate the use of chewing sticks among these populations in the US.

Methods

African immigrants residing in West Philadelphia were invited to participate in focus groups to discuss the use of chewing sticks. The first two sets of focus groups were recruited through the Community Liaison Office of the Philadelphia Department of Health and consisted of 12 African women. The focus groups were facilitated by a female dentist of African descent and a community liaison, fluent in French and English, served as an interpreter since the women only spoke French. The discussions were held in a hair braiding shop where all the 12 women worked. The other sets of interviews were conducted during two community health fairs in the community public park specifically held for African immigrants residing in West Philadelphia. Volunteers were recruited as they visited the booth of the dental school. The interviews were conducted by two facilitators of African descent. All interviews with a mixed group of men and women lasted approximately two hours. Interviews were audio-taped with consent from volunteers. These were transcribed and responses were categorized according to themes and later analyzed using the categories for descriptive analysis.

Sample questions for focus groups were:

Did you use chewing stick in your home country?

Do you continue to use chewing stick in the US?

What are your reasons for using chewing stick?

Did you stop using chewing sticks? Why?

Do you have local name for chewing sticks in your language?

Do you use it alone? If not, what do you use it with?

This study was approved by the Institutional Review Board (IRB) of the University of Pennsylvania and volunteers signed an IRB informed consent document prior to participation.

Table 2. Perceived benefits of chewing sticks as reported by a selected group of African immigrants living in West Philadelphia

For Better Oral Health	*Number (Percent)*
Cleans teeth effectively	50 (100%)
Removes mouth odor	43 (86%)
Makes teeth whiter	40 (80%)
Kills germs	50 (100%)
Treats gum problems	45 (90%)
Strengthens teeth	42 (84%)
Cleans tongue	46 (92%)
For General Health	
Treats pink eye	27 (54%)
Treats colds	15 (30%)
Assists in digestion	12 (24%)
Anti-emetic	28 (56%)
Reduces fever	14 (28%)
Treats stomach ache	24 (48%)
Reduces fatigue	16 (32%)
For Religious reasons	
Ramadan	26 (52%)
Manner of Use	
Chewing stick alone	26 (52%)
Chewing stick + charcoal	15 (30%)
Chewing stick + ginger or toothpaste	9 (18%)

Results

A convenience sample consisting of fifty volunteers (22 female, 28 male) representing 15 African countries participated in the study. All were first generation immigrants who had lived in the U.S. for 5 – 10 years. Mean age was 34.5 years; 82% had completed a high school education in their home countries. Fifty one per cent claimed to speak English well; however, the 12 women in the first two focus groups spoke only French. Arabic was spoken by 21% while 17% spoke more than one language. Sixty-seven per cent work 20 plus hours weekly in low-income jobs. The remaining 33% were unemployed or attending school on a part-time basis.

Information about their oral health care showed that all of the participants had used chewing sticks in their home countries. However, only 73% continued its use after migration to the U.S. because they believe that chewing sticks clean better compared with toothbrushes. Another major reason for its continued use was the perceived medicinal value to the teeth, gums and different systems in the body. Chewing sticks also played a part in the practice of their religion i.e. maintaining a clean mouth during the month of Ramadan. Uses and perceived benefits of chewing sticks are summarized in Table 2. Among its users, 52% use the stick alone as a cleansing tool; the rest used other substances to enhance its effects. Thirty percent applied charcoal or charcoal ash to the chewing stick to whiten the teeth while 17.5% used ground ginger, ground palm tree, or toothpaste as a medium for brushing (Table 3). The frequency of chewing stick use also varied: 40% cleaned their teeth twice daily while 60% cleaned once in the morning. The supply of chewing sticks did not seem to pose a problem to the majority as 50% percent purchased sticks from local African stores and the rest obtained them directly from their home countries through family or friends who come to visit. While availability was not a hindrance to this group, this appeared to be the main issue with 27% of the participants who had discontinued use. They claimed that chewing sticks were not readily available to them and toothbrushes clean faster and were easier to use.

The participants acknowledge that even with the use of chewing sticks, they still encountered other oral health problems such as inflammation of the gums and tooth abscess. Results of the oral screening conducted during the health fair revealed that 68% need urgent care, 70% suffer from oral health problems, and 36% complained of toothache. Only 30% had dental insurance and although 61% claimed that they sought care in private offices or hospitals, there was a general reluctance to consult a dentist or medical doctor due to costs. To deal with oral health problems, 20% of all the participants reported that when they experienced toothache, they applied home remedies such as crushed aspirin on the affected tooth or apply Vicks Vaporub ointment on the cheek. Similarly, for gum abscess, they poked and/or tattooed the gums with needles to release pressure. Only when these remedies failed to relieve the symptoms, did they seek emergency care at the hospital.

Discussion

A limitation in the study is the use of a convenience sample of African immigrants that may not be representative of all immigrants in West Philadelphia or other African immigrant communities in the U.S. Thus findings and conclusions in this study may not be generalized to the whole African immigrant population.

Interviews with this diverse group of African immigrants showed that the practice of traditional methods of tooth cleaning and treatment transcends geographic barriers, language and years of residing in the U.S. Study participants originated from various countries in Africa but they unvaryingly continued the use of chewing sticks in the belief that it is a better cleaning tool for the teeth and mouth and for its added medical benefits. The common thread among this group was the low level of education, low-income generating work and/or unemployment and lack of insurance. With about 70% in the study sample who did not have medical or dental insurance, chewing sticks were especially beneficial for the relief of various symptoms without the added cost of seeing a provider or buying medicines. Other beneficial properties included danalgesic, astringent, antimicrobial, buffering, and anti-plaque forming activity (Chiappelli *et al*., 2002). It is also convenient that within the neighborhood where the immigrants have settled, there are African stores that make available chewing sticks at affordable prices. The frequency of visiting relatives and friends from their home countries that ensures the flow of supply from Africa may also serve as an encouragement for its continued use. It is then quite surprising to have a group (27%) who claimed that they have discontinued its use because chewing sticks were not readily available to them. This

may indicate that people in this group may have less frequent contact with fellow African immigrants although they still reside in the same community. Another reason given by this group was that toothbrushes are easier to use and clean faster. Their reason for discontinued use does not nullify the primary reason for the use of the chewing stick – that it is a cleansing aid. Instead, the switch to toothbrush is more for its convenience. The use of chewing sticks alone or in combination with abrasives such as charcoal ash, ground ginger and ground palm tree, are regular oral hygiene implementation tools in African communities. This could be important for participants who are adapting to a lifestyle involving school or work and is consistent with observations made in acculturation studies that indicate immigrants either assimilate into the culture of the host country, retain their own cultural beliefs and practices, or blend features of the cultures of the country of origin and the new country (Berry, 1990). It is significant that study participants acknowledge the limitations of the use of chewing sticks, that in spite of its acclaimed medicinal benefits, they still suffer from various oral health problems. They resorted to various home remedies first, and when these failed and their conditions worsened, then they sought emergency care in hospitals. When asked why they do not make use of the community health centers or the local dental school for care, they cited economic factors (lack of medical and dental insurance and lack of "disposable" income for health care) but they also allude to their immigration status in the U.S. Several admitted to their inability to present the necessary documents such as proof of a permanent address or state IDs for identification that are requested when they consult the clinics. Because of the sensitivity of this issue, the study investigators did not pursue questions related to this matter.

While conventional (modern) tooth brushing with toothpaste is arguably the most common method of maintaining oral hygiene in developed nations, chewing sticks offer an alternative oral hygiene tool especially among groups who choose to use it for its long-established association with oral and dental hygiene, therapeutic benefits, and for religious reasons such as in cleansing preparations for and during Ramadan among Moslems. Its use is also noted in populations where professional care is limited and toothbrushes are less affordable. The World Health Organization supports the use of chewing sticks in promotion of oral hygiene in areas with limited resources. In a policy statement released in 1987, the WHO affirmed that "Traditional oral hygiene practices, like chewing sticks, should be encouraged in areas where their use is effective and customary". Health care providers in the U.S. however may not be familiar with this alternative tooth cleaning device. Study participants who have legal documentation and are financially able to seek regular care, do not disclose their use of chewing stick to health care providers for fear that this practice may be labeled as "primitive" and ineffective and may be discouraged from using it. This may be a reflection of mistrust of the system and of health workers which has been identified as a factor in the disparities in health care (Berk and Schur, 2001). Health care providers need to be open to explore and be knowledgeable of alternative oral health practices to be able to have meaningful discussions with their patients.

A significant implication of the use of chewing sticks is its limitation in preventing certain oral health conditions e.g. periodontal diseases as shown in the results of oral screening of the African immigrants in this study. Unlike the conventional toothbrush, the bristles of the chewing stick are situated along the long axis of its handle. Consequently, pits and fissures of the posterior teeth as well lingual surfaces and interproximal spaces are difficult to access. This predisposes affected teeth to pit and fissure caries and periodontal disease. (Mumghamba and Fabian, 2005) However, other data suggest that with proper oral hygiene instruction, chewing sticks are effective in removing plaque and improving gingival health. (Van Pattenstein Heldreman *et al*., 1992) An open acceptance of the value of the use of chewing sticks may lead to a more frank discussion about its use in maintaining oral health in a culturally sensitive way and to encourage the immigrants to seek appropriate care early and not wait until conditions worsen.

Existing studies frequently lack specific details comparing the cleansing efficacy of chewing stick and manual toothbrushes thus more studies are needed to address details concerning technique, time, duration and frequency of use in order to assess its effectiveness as an oral health aid.

Conclusion

This exploratory study of the use of traditional health practice among a growing population in the U.S. showed that the use of chewing stick is an integral part of the culture of African immigrants who are marginalized and have no medical or dental insurance. Its use persistsed within this diverse group after migration to the U.S. The major reasons for the continued use of chewing sticks were its economic advantages, availability, belief that it cleans better than toothbrush, and its added medicinal benefits. As the number of African immigrants increase and demographics change, health providers will continue to encounter this practice and will need to be aware and sensitive to the cultural factors, perceptions and behavior affecting the oral health needs of this population. By understanding the benefits and limitations of chewing sticks, health providers will be able to offer proper oral hygiene instruction and maximize on the benefits of this oral hygiene tool. Additionally, open discussions with patients about alternative health practices may restore trust in the health system and break through ethnic barriers that affect oral health outcomes.

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