Illness and sickness in contexts of change: *Eghindi* among Sahrawi refugees of Western Sahara

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Media teaser: How are illnesses and sicknesses modified with displacement and cultural change? We discuss the fate of the illness *eghindi* among Sahrawi refugees of Western Sahara

This paper, based on primary research in Sahrawi refugee camps, explores the modification of illness and sickness experiences in response to cultural and environmental change. *Eghindi* is built around a set of pathological states experienced by Sahrawi in the desert environment of Western Sahara. Its core symptoms are caused by osmotic imbalances related to salt consumption. In 1975 many Sahrawi were exiled into refugee camps and have since experienced radical sociocultural changes, which are reflected in changing explanatory models of eghindi. Conservative (i.e., attached to traditional Sahrawi culture) and older refugees expanded its conceptualization to include new morbific factors, while progressive (i.e., acculturated at varying degrees with Western culture) and younger refugees began challenging its existence. Eghindi became embodied within a broader process of negotiation and redefinition of Sahrawi cultural identity. Our findings provide a framework for thinking

about the evolution of illness in response to migration and displacement, and highlight that when explanatory models evolve, intra-cultural tensions can arise within a given population.

Keywords: Ethnoecology; Ethnomedicine; Explanatory Models; Refugee Camps; Sahara Desert; Salt Intake; Sickness

During the past decade there has been a growing interest in the ways traditional medicinal knowledge changes in contexts of urbanization, migration, and diaspora within the field of ethnobiology (Waldstein and Adams 2006; Pieroni and Vandebroek 2007). For example, a framework for studying the impact of migration and cultural change in the use of medicinal remedies has been developed, which helps us to better understand the relationship between population movements and healing strategies (Volpato, Godínez, and Beyra 2009; Muniz de Medeiros et al. 2012). However, this welcomed line of research has been limited by minimal engagement with medical anthropology and an absence of studies that address the effects of sociocultural change on knowledge of disease (pathological states that manifest as signs and symptoms), illness (the individual experience of pathological signs and symptoms), and sickness (the socially shared construction of illness and disease) (Young 1982). In this paper we explore the possible ways through which sickness constructions and illness and disease experiences are modified in response to sociocultural and environmental change. By using as a case study the Sahrawi condition called *eghindi*, we show that cultural change can lead people to create, abandon, and/or adapt health concepts and categorizations to new cultural paradigms, and that different models may be adhered to by different social strata of a single population (e.g., according to sex, age, education, lifestyle), with the possibility of creating intra-cultural tensions.

Eghindi is widely recognized among Sahrawi nomads and refugees of Western Sahara but has no discreetly labelled biomedical equivalent. It is a multi-faceted condition that

includes various pathological states that result from interactions with the external environment through eating (e.g., consuming an excess of salty or bitter foods) and breathing (e.g., inhaling the scent of dead bodies). After brief descriptions of our methods and research site, we begin by addressing eghindi as Sahrawi do, qualitatively describing its epidemiology, known causes, symptoms, and therapies, allowing us to build a basic explanatory model of eghindi. We then consider eghindi as a culturally defined and constructed experience of distress with biological, social, and spiritual roots (McElroy 1996). What emerges is a distinction between "nomadic" (as described in historical sources, through retrospective interviews, and by contemporary nomads) and "sedentary" (as described by Sahrawi refugees) models of eghindi. To explain this distinction we draw on biocultural and critical medical anthropology. Exploration of the biocultural aspects (i.e., the local environment and Sahrawi adaptations to it) of the nomadic explanatory model shows how Sahrawi related environmental elements to experiences of eghindi and associated behavioral practices within their traditional nomadic context. The sedentary explanatory model reflects the changes that have occurred in Sahrawi society during the last forty years, especially forced displacement, dependence on food aid, and the assimilation by refugees of Western food and health concepts and practices. In fact, with displacement to refugee camps and the loss of their livelihoods, Sahrawi refugees found themselves in a condition where traditional knowledge, beliefs, values, and modes of subsistence could not be maintained and transmitted. Instead, food aid and biomedical paradigms replaced in the camps the pastoral life of the Sahrawi, under the guidance and organization of the Polisario Front, which promoted a development based on Western concepts and practices in order to prepare refugees to be citizens of a "modern" Western Sahara, upon return to their homeland. We discuss how these changes influenced the conceptualization of eghindi, and how eghindi was adapted and challenged at the same time.

We conclude by arguing that the investigation of explanatory models should address social and cultural changes as they relate to issues of identity and social acceptance. The construction of a sickness around various pathological states and individual experiences of illness is continually changing especially in relation to migration, acculturation, and cultural redefinition. Moreover, changes in livelihoods and in a population's living environment may bring changes to the core pathological states of a sickness, which may cause (1) a redefinition of the pathological states involved while maintaining the narrative and explanations of the sickness, e.g., for cultural identification; or (2) an abandonment of the sickness as an explanation of pathological states, either because those pathologies are no longer present, or because alternative explanations (e.g., from other medical systems) for individual experiences of illness have been adopted. In the case of eghindi both these processes are taking place.

RESEARCH SITE

"Sahrawi" is the name given to the tribes of nomadic and pastoral people who traditionally inhabited a desert area of north western Africa including Western Sahara, Northern Mauritania, and part of south western Algeria. Sahrawi people were nomadic, pasturing camels, goats, and sheep in the plains of Western Sahara and relying for food on livestock products as well as on dates, sugar, cereals, and legumes bartered for livestock in markets peripheral to their nomadic areas (Caro Baroja 1955). In 1975, after fifty years of Spanish colonial rule and following the occupation of Western Sahara by Morocco, about 70,000 Sahrawi became refugees after fleeing the Moroccan army. Nowadays, after sixteen years of war (1975-1991) and the seclusion of refugees from most Western Saharan territories by a military-equipped wall that cuts Western Sahara in a north-south direction, about 165,000 Sahrawi people live in four refugee camps located on a desert plateau called Hamada near the Algerian city of Tindouf (San Martin 2010). There, they have been waiting since the

ceasefire of 1991 for an UN-sponsored referendum for self-determination to be held, which would allow them to return to their homeland.

In the camps, refugees live in canvas tents and mud brick huts, with severe problems of water and food supply. The European Union, UN agencies, Algeria, and several solidarity groups make food, shelter, and other basic commodities available (San Martin 2010). Throughout the years, in the search for an improvement of the quality of life in the camps, refugees have developed an informal economy with the marketing of many products, expanding trading routes through the camps – between Mauritania, Algeria, and Spain, where the majority of the Sahrawi diaspora lives (Dedenis 2005; Herz 2013). In the process they have also reactivated social and market networks of procurement of traditional ethnobiological products (Volpato, Rossi, and Dentoni 2013).

Besides the camps, Sahrawi refugees – through their political representative, the Polisario Front – also have access to the eastern part of the Western Sahara, which was taken away from Moroccan control through a guerrilla war that lasted until the peace agreement of 1991 (Bathia 2001). These inland areas are the so-called "liberated territories" (approximately 20 percent of the total Western Sahara), while the remaining "occupied territories" are under the administering authority of the Moroccan government. Pastoral areas of the liberated territories are important in refugees' efforts to recover traditional livelihoods and cultural and social practices, from livestock husbandry to medicinal plant use (Corbet 2008; Volpato, Kourková, and Zelený 2012).

METHODS

The ethnographic data used in this study were drawn from fieldwork in Sahrawi refugee camps and in the liberated territories conducted by the first author between 2005 and 2009, as well as from previously published literature. Fieldwork methods included semi-structured and

retrospective interviews with refugees and nomads. Semi-structured interviews focused on collecting data about the etiology, epidemiology, reported symptoms, treatment, and prevention of eghindi and were conducted to qualitatively address contemporary models of eghindi among refugees. Retrospective interviews were conducted mainly with older informants and aimed at obtaining information about eghindi in the traditional nomadic life in order to reconstruct eghindi before forced displacement, and thus lay the baseline to understand how it has changed. Some 38 semi-structured interviews and 14 retrospective interviews were conducted with a variety of informants identified randomly; informants differed in terms of sex (about 60 percent were women), age (we included all ages), education (we included non-schooled refugees and nomads as well as refugees with a University degree), and main productive activity (three informants were traditional healers, others were non-working refugees, herders, shop-keepers, etc.). Information about eghindi was also collected in an informal way by bringing up the topic during conversations with refugees and with expatriates working with local NGOs, mostly Spanish and Italians. This provided a picture of how eghindi is understood by the wide community of NGO workers present in the refugee camps.

Interviews were conducted in Hassaniya (the Arabic language with a Berber substrate spoken by the Sahrawi) and Spanish. In the presence of the first author, local research assistants, selected on the basis of their bilingualism Hassaniya/Spanish and familiarity with Sahrawi cultural heritage, asked the questions in Hassaniya and translated the answers into Spanish (the second most frequently spoken language among the Sahrawi, which is spoken fluently by both authors). Interviews were recorded and transcribed with the help of the same research assistant to minimize translation errors and clarify information. Transcripts were then entered into Nvivo, qualitative data management software, and codes, concepts, and categories were generated during the analysis of qualitative data, which allowed us to

develop the theory we expose in this paper to understand eghindi. Prior informed consent was obtained verbally before interviews were conducted. Participants were given an explanation of the methodology, aims, and outcomes of the study. Throughout the field study, the ethical guidelines adopted by the American Anthropological Association (AAA 1998) and by the International Society of Ethnobiology (International Society of Ethnobiology 2006) were followed. Plant nomenclature follows the Sahara and Western Sahara botanical standard treatises (Ozenda 1991; Lebrun 1998) for Saharan species and the International Plant Name Index (www.ipni.org) for all the others. Voucher specimens (i.e., representative specimens of the plants, collected during interviews, and used to confirm the identity of the species referred to in the study) have been deposited in the National Herbarium of The Netherlands (Wageningen Branch – Herbarium Vadense).

SAHRAWI EXPLANATORY MODELS OF EGHINDI

The explanatory model was conceived in the late 1970s by Arthur Kleinman and colleagues in order to understand cultural ideas about illness and disease and provide appropriate medical treatment to patients (Kleinman, Eisenberg, and Good 1978). Explanatory models are characterized by the following five elements: (1) an explanation of the presumed cause(s) of the malady, (2) associated signs and symptoms, (3) an explanation of the pathology and physiology involved, (4) prognosis, and (5) recommended treatments. Although based on individual experiences of illness, explanatory models are culturally determined and widely shared among members of a given culture (Weller and Baer 2001), and thus provide a description of sickness, i.e., the socially shared construction based on illness and disease (Young 1982). The elicitation and construction of explanatory models allow the anthropologist to play with theoretical concepts in ways that provide insight into the evolution of illness experiences and sickness construction, as they reflect changes in social

and cultural life. As we will show, multiple explanatory models of eghindi thrive in Sahrawi refugee camps, even though they are in environments full of biomedical and other global capitalist influences that deny its existence.

Eghindi (and all its possible transliterations: *eguindi*, *ighindi*, *iguindi*, *igendi*) is cited only a few times in the already scant ethnological reports and anthropological studies on Western Sahara nomads and refugees. Mentions of the causes of eghindi are brief, sparse, and focused on the consumption of brackish/salty water (Guinea 1948; Boyer 1962) or exposure to strong smells (Caro Baroja 1955). In the literature review, we did not find any eghindi-like illness among other nomadic and pastoral populations of the world, nor among the neighboring Tuareg. It seems thus that eghindi and its basic understanding are limited to Hassaniya-speaking nomadic tribes of Western Sahara and Mauritania. The earliest published report of the condition is among Mauritanian Moors (Commléran 1911). Commléran (324-327) describes iguindi as an affliction characterized by a "hard edema of the inferior members, accompanied by generally not severe gastro-intestinal problems," and having as "unique etiological cause the consumption of brackish or salty water," due to the prevalence of wells with salty or brackish water in the area. When compelled in specific conditions (e.g., when travelling and/or shepherding a camel herd in salty environments) to drink salty water from these wells, nomads would become affected by a series of problems known as iguindi, treatable with the consumption of sweet water and food. More recent studies that touch marginally on eghindi in Mauritania tentatively associate it with diseases such as tuberculosis and epilepsy (Ould Taleb 2007; Traore et al. 1998). Recently, eghindi has also been reported to be caused by excesses in other substances. Tauzin (2001:176), for example, in a note to a book about the feminine figure in Moor society, says that igendi "occurs due to the ingestion of food too salty, or too bitter, or also too fatty. A long exposition to sun can equally cause it. It connotes excess, sometimes inseparable from the absence of self-control." It may also be

caused by exposure to pollutants or allergens (Mohamed Embarek 2005). The Sahrawi explanatory models of eghindi presented below are based on perceived causes and effects of water and salt balance in the desert that have been expanded to include other environmental agents. In Table 1, we list etiologic factors, reported symptoms, and treatments of eghindi as reported by Sahrawi informants and in descending order of importance.

Perceived Causes of Eghindi

Among our Sahrawi informants, in its more widely used meaning, eghindi is caused by foods and drinks. "The right hand is the main agent of eghindi, because one uses the right hand for cooking and eating," in the words of one refugee. The most reported and almost emblematic food-borne eghindi is caused by the ingestion of kitchen salt (NaCl), salty food, or salty/brackish water. Other relevant etiological factors include the ingestion of hot/spicy and bitter foods, concentrated and bitter tea, milk with strong smell or taste, and burnt foods (e.g., meat, bread). In Table 2, we report a list of thirteen vegetal species that can cause eghindi, including traditional medicinal products like the seeds of *Whitamnia somnifera* or the aerial parts of *Ruta tuberculata*. Eight of the 13 plants cause eghindi by giving a strong or bitter taste to milk obtained from camels that grazed these plants in large amounts. Drinking milk with such a strong bitter or hot taste (e.g., from *Anvillea radiata*, *Asteriscus graveolens*, *Launaea arborescens*) was an important cause of eghindi among Sahrawi nomads. According to informants, when Sahrawi were fully nomadic there were times in which all the *friq* (the nomadic camp) had eghindi following the consumption of bitter milk due to the flora of local grazing area. In order to avoid this, Sahrawi used to add sugar to the milk, or boil, and/or dilute it (and the taste) with water. Smell-borne eghindi is due to burnt smells (e.g., of burnt garbage), strong smells (e.g., of smoke), chemical smells (e.g., of chemical products, cars' and trucks' discharge gases), or dust.

Reported Symptoms

Among Sahrawi nomads and refugees eghindi may manifest in different ways depending on the specific cause. Based on the interviews, the most frequently reported symptoms of food-borne eghindi are swelling of the front and side of the neck, a burning feeling in the throat and sometimes the stomach, as well as skin rashes and itching. Other reported symptoms include respiratory difficulties, tachycardia, swollen face, earache, stomach problems, and even a temporary paralysis (e.g., of a side of the face after drinking a bitter tea). Smell-borne eghindi manifests with – in the words of one informant – "dryness in blood circulation that does not come up in any medical analyses," as well as with respiratory difficulties (e.g., asthmatic episodes), dry cough, sneezing, and bad dreams. Smell-borne eghindi at times also leads to neck swelling.

Prognosis and Treatment

Sometimes, cases of eghindi may resolve themselves without treatment. For example, as Ahmed (42 years old) recalled: "Last Friday evening I was invited for dinner and I ate part of the tripe. They were bitter, and at two or three in the morning, while sleeping, an itching in the ear started, and when this happens, it is the signal of eghindi. The day after I felt a burning feeling in the stomach, which disappeared in two or three days without a treatment; I did not take any treatment in this occasion because I knew [by experience] that eghindi from tripe would disappear alone in few days." However, due to the severity of symptoms eghindi is usually treated using a variety of products, most of vegetal origin. The plant species used to treat eghindi are reported in Table 3 in alphabetical order by botanical name. Sahrawi use products from 17 different species. They consist of: sweet-tasting and good-smelling resins (e.g., from *Acacia* tress and *Pistacia lentiscus*); sweet fruits harvested from the wild (e.g., from *Lycium intricatum* and *Rhus* species) or purchased (e.g., figs, dates); products appreciated for their taste or smell (e.g., *Lavandula* species); and remedies targeting specific eghindi symptoms (e.g., baobab fruit pulp for digestive problems). Remedies are usually

ingested, apart from topical applications related to earache and inhalations of pleasant smoke (from saffron and mastic resin) to treat smell-borne eghindi. By far the most used product is the resin of *Acacia tortilis* (and less importantly from *Acacia ehrenbergiana* and *Acacia seyal*). As a remedy for *eghindi*, this resin is mixed with dates, dissolved in tea or, more commonly, triturated and mixed with water.

Among the products of animal origin used, the most important is honey. As it is not produced in the desert, much of the honey present among refugee families is purchased in Tindouf, sent to the camps by emigrants, or brought there as gifts by Cooperation workers or Sahrawi children returning from summer holidays in Spain (Crivello, Fiddian, and Chatty 2005:19). In serious cases of eghindi (e.g., with acute neck and face swelling), goat liver cooked with sugar, and dry camel meat roasted with barley grains are used as remedies. Sahrawi explain that dry products (without water or salt) like dry meat are able to "absorb the swelling from the inside." Sultana (62 years old) recalled: "My nephew once ate the salty remaining from the bottom of the cooking pot. He swelled a lot, especially the face was swollen, his eyes were very small, and his heart was racing. His conditions were severe and thus my daughter went straight to the butchery here in the refugee camp to buy a goat liver. We baked the liver on the embers with sugar all over it, and gave it to him to eat in small pieces. Also we washed his face with peach-flavored water. The following day he was already feeling better."

BIOCULTURAL ROOTS OF EGHINDI AMONG SAHRAWI NOMADS

Biocultural perspectives in medical anthropology stress the ecological complexity of illness and disease etiology (Armelagos et al. 1992; McElroy and Townsend 1996). In order to fully understand what eghindi is, it is necessary to examine the various (biological, ecological, cultural, etc.) influences at the root of the condition. The most prototypical ethnomedical

explanation of eghindi is a rationale for maintaining homeostasis in the desert by balancing water and sodium levels through an avoidance of salt consumption. Eghindi is based on the idea that high concentrations of salt in some foods or drinks create an imbalance in the body that can lead to several signs and symptoms (e.g., neck swelling, burning feeling of the stomach, etc.) and is treated with sweet remedies, in accordance with the rule of the opposites. A discussion of the role of salt among Western Sahara nomads reveals that eghindi reinforces a series of food rules related to salt and other substances (spicy, bitter, burnt foods, and smells). Because the definition of a taste or smell as "good" or "bad" is culturally determined, eghindi as a cultural construct is recognized, accepted, and shared by the tribes of camel nomads of Western Sahara and Northern Mauritania.

Eghindi, Sahrawi nomads, and salt

In order to understand eghindi, it is necessary to address the role of salt and water in Sahrawi nomads' lives. The Sahara environment is saturated with salt: salty crust on the ground, salt particles in the air, salty and brackish water. To cope with this, desert animals (including humans) have physiological, morphological, and behavioral adaptations to water shortage and salt saturation (Macfarlane 1973; Louw and Seely 1982). Humans living in these environments also have cultural adaptations that reduce their salt and water consumption and maintain a rigorous homeostatic balance (Rubini 1970). Salt consumption and addition of salt to food broadly depend on populations' modes of subsistence and living environment, with hunters, nomads, and pastorals usually obtaining all the salt they need from meat, milk, and blood of wild and domesticated animals (Denton 1969; MacGregor and de Wardener 1998), who in turn obtain salts from salt licks and halophytic plants (Lev-Ran and Porta 2005). The Sahrawi look down on salt consumption, which makes sense in the light of the fact that they are camel pastoralists, and camels consume six times more salt than any other herbivore. Camel milk and meat are saltier than milk and meats from other domesticated animals, and

alone provide enough salt to camel pastoralists. Sahrawi nomads tried to cope with an environment rich in salt and poor in sweet water in a variety of ways. First and foremost, they developed soberness in water consumption and an avoidance of salt and salty food besides the milk and meat from their animals (Paque 1980). Physiological reasons for avoiding salt include the need to use water sparingly (salt consumption increases water needs), the importance of a low-sodium diet in preserving cortico-adrenal functions, and the prevention of hypertension (Paque year?).

Among Saharan nomads, the practices and norms related to salt consumption are embedded in a system of rituals and beliefs (Paque 1984). Eghindi roughly functions as a salt taboo, enforcing a set of health and food practices and rules. Like salt taboos among other populations (Neumann et al. 1977), the recognition and labelling of eghindi and related practices that developed in response to it probably began among Sahrawi in order to limit salt intake. But avoiding salty or brackish water was not easy for Sahrawi nomads: wells were few in Western Sahara and most had brackish water with high concentrations of chloride, sodium, and nitrates (Boyer 1962). These concentrations may well be responsible for symptoms of eghindi: water rich in chloride and sodium can cause edemas, and nitrates can cause intoxications, especially if food intake does not provide enough carbohydrates to enhance the elimination of nitrates by transforming them into ammonia (Boyer year?).

Edemas can be caused by continued or increased intakes of sodium (Neumann et al. 1977), and by changes in the hydrostatic and oncotic pressures within the body causing unbalances in fluid homeostasis. Edemas caused by fluid retention are usually temporary, and they occur when water accumulates in the body as consequence of the ingestion of salty food and high-sodium meals. Edemas are also among the clinical manifestations of hypernatrenia, which is an elevated sodium level in the blood. After ingesting salt in excess, Sahrawi may be exposed to hypervolemic reactions with severe elevations of sodium levels. At its worst,

hypernatrenia can cause seizures and coma, which may explain the correlation between eghindi and epilepsy proposed by Traore et al. (1998). Hypernatrenia triggers a sensation of thirst and free intake of water to correct the fluid imbalance. However, due to physiological and cultural adaptations to the desert environment, Sahrawi do not ingest copious water and their sensation of thirst may be perceived as a "burning sensation" in the mouth and upper digestive ways, as reported by many informants. This burning sensation would be treated with sweet water and other sweet products.

The use of sweet products to treat salt-borne eghindi may have its origin in their contrast in taste with salty (and bitter) substances, and may have a physiological and cognitive basis as well. Under non-thirst conditions, waters with about 1-2 g/l of salt have a sweetish taste, while their taste becomes salty around 4 g/l, and eventually salty and bitter around 8-12 g/l (Paque 1998:85). The preference for a sweet taste and the use of sweet remedies to treat eghindi may be derived from the relative tastes and salt concentrations of waters in the desert, and the selection for foods and drinks of sweet taste may be a behavioral adaptation to minimize salt intake. Hence, as argued by Paque, Western Sahara nomads have developed physiological "stop signals" when too much salt is ingested. These stop signals (e.g., headaches) and their physical manifestations (e.g., edemas) are the core of eghindi. They have various – sometimes personal – manifestations and, as shall be seen, are still present among Sahrawi refugees in spite of the social and cultural changes that they went through during the last forty years.

Eghindi and Sahrawi food norms

Salt is at the core of eghindi, but our data suggest that in its evolution eghindi has come to include other morbific factors (e.g., bitter flavors and strong smells, see Table 1) and associated symptoms. These symptoms include extrasystoles caused by adrenergic substances (e.g., tea); digestive problems due to food that is too fatty or burnt, or that is badly processed

or stored; dermatitis and skin rashes caused by allergenic substances; and episodes of asthma and intoxication caused by inhaled substances (Mohamed Embarek 2005). The rationale behind salt-borne eghindi was thus extended to other morbific factors on the basis of cognitive association. These factors cause eghindi because of their concentration in foods, drinks, and in the local environment. At the same time, transgressions of Sahrawi food and behavioral norms, besides that of salting food, became conceptualized as eghindi. Arguably, in some cases this was a result of a process in which Sahrawi food norms were strengthened and enforced by associating them with pathological states and labeling them as a sickness. Thus, eghindi became a cultural means through which Sahrawi nomads made sense and transmitted to younger generations the rules of engagement with the desert environment and its tastes and smells.

Traditionally, Sahrawi nomads' alimentation was based on pastoral products, and extreme soberness in eating and drinking, both in terms of variety and quantity, was enforced culturally. The voluntary or involuntary transgression of these norms would trigger eghindi, associated pathological states, and treatment practices. Avoiding eghindi includes a series of norms for correct food consumption, especially for children (e.g., do not add salt, eat regularly, do not eat too much, etc.). Through the transmission of food norms across generations, Sahrawi are exposed to eghindi from childhood. Parents classify pathological states in children as eghindi (or not) and identify a morbific factor, thus educating children about eghindi. Some mothers will prohibit some foods to children (e.g., cheese, olives) saying "if you eat this, you will get eghindi," and will often attribute cases of eghindi in their children to some food or drink they ingested outside the home (e.g., in other tents). Children learn to connect a desire for sweet products with eghindi. On one of the first author's travels to the camps, a pot of honey was brought along as a present to a research assistant. He took the pot in the hand, showed it to his five-year old daughter, and told her: "Look at the honey.

This is good for eghindi." Children assimilate this relationship and eventually start from an age of 10-15 using it themselves to explain the effects of certain foods and smells.

Eghindi as an explanatory model of engagement with the desert environment is transmitted across generations and is also shared and enforced among adults along with associated cultural norms. In social meetings, eghindi prevention becomes a way of enforcing food rules, and hence also of enforcing a Sahrawi cultural identity around food. This point is exemplified in relation to bitter tea: when someone prepares a bitter tea that causes eghindi, then that person will be criticized for preparing such a tea, will be victim of scorn in reference to his/her tea causing eghindi, and will not be allowed to prepare tea again. On a similar note, Cozza (2010:126), while discussing food and drink preferences of young Sahrawi refugees, reports that youth are reprimanded when they are not able to prepare a good tea.

THE INFLUENCE OF SOCIAL AND ENVIRONMENTAL CHANGE ON EXPERIENCES AND EXPLANATORY MODELS OF EGHINDI

Historically, the globalization of biomedicine has been effected through the relationships that have developed between the medical profession, the state, and the pharmaceutical and biotechnology industries (Clarke et al. 2003). While in many parts of the world the process of biomedicalization has displaced traditional medical concepts, therapeutic techniques, and even whole systems (Waldstein 2010), certain environmental, political, economic, and/or social contexts may prevent this from happening. By critically examining these contexts, we can better explain how and why certain medical concepts are adapted, rather than abandoned when social and environmental change challenges them. We have seen that eghindi is a multi-faceted condition that is part of the cultural heritage of Sahrawi nomads. Its initial conceptualization appears to have been aimed at formalizing rules regarding foods and

smells, and explaining associated pathological states, in the desert environment. However, in 1975 many Sahrawi were forced into refugee camps and since then radical changes have occurred in their social organization and culture, including eghindi. As alimentation, water procurement, engagement with the desert environment, and consequently the nature and intensity of pathological states changed, the explanatory power of eghindi was challenged. Different processes have acted upon the understanding of eghindi among refugees during the last forty years. Below, we address the adaptation of eghindi to the new context of the refugee camps as a means of preserving Sahrawi food norms and cultural identity.

With the war, the exile to the refugee camps, and the dependence on food aid first, and with the trade expansion and the availability of new industrial products later, Sahrawi found themselves in a situation where traditional food norms were difficult to follow (Cozza 2010). This has occurred within refugees' struggle to recover their lost nomadic life and cultural heritage, and the simultaneous attraction of younger refugees towards a Western lifestyle. The literature on refugees identifies two contrasting processes of cultural change in situations of exile (Couldrey and Morris 1999). The first is a tendency toward the loss and abandonment of traditional culture, which is maintained only among elderly and specific (often marginal) groups. The second is a process of recovery and maintenance of traditional culture in order to promote recovery of productive activities and cultural identity. Both of these processes take place in matters of eghindi, where its conceptualization seems to have taken two paths within the Sahrawi refugee population. Some refugees expanded their conceptualization of eghindi by associating the new foods (e.g., canned fish, cheese, pizza) and smells (e.g., garbage, manure, chemicals) of the camps with pathological states. While refugees welcomed new sweets, candies, and concentrated juices (some of which have been adopted as eghindi remedies), they blamed an increased number of episodes of eghindi on the dressings, spices, and processed salty products that came with food aid. More conservative

(i.e., attached to traditional Sahrawi culture) and older refugees tend to regard most of the processed foods as possible causes of eghindi: some elderly do not eat canned tomato, or canned fish, do not drink packed cow milk, or powder milk. This is how Sidahmed (38 years old) explained this: "During nomadic life people were used to the few food products they relied on, that were milk, meat, and flour, along with tea and sugar. To older people, every change to this food pattern is harmful." Episodes of food-borne eghindi often occur when Sahrawi eat food prepared by European expatriates (e.g., pasta and pizza cooked by Italians), which they invariably regard as too salty. The list of morbific factors for eghindi in the refugee camps even included intravenous drips given in the local hospital. A Cuban doctor working in the camps said: "Sahrawi have a rejection for salt, which they identify as a main cause of eghindi. In some cases, when admitted to hospital, they even refuse intravenous drips in saline fluid [a solution of sodium chloride at 0.9 percent concentration] if they are told that it contains salt."

Along with not accepting processed foods comes the emphasis that older and conservative refugees put on the importance of traditional foods (e.g., camel meat and milk) for culture and health. These refugees challenge the value (e.g., nutritional properties, taste) of some new foods present in the markets and made available with food aid. They contrast these processed foods and the alimentation in the camps with livestock products of the nomadic territory, indicating that restoring traditional food habits is the way to eat like a Sahrawi and prevent eghindi. Moreover, to believe in eghindi implies the use of traditional remedies to treat it, as we found no case of substitution of these remedies with biomedical products. The procurement and use of traditional remedies for eghindi support the link between Sahrawi refugees and their former nomadic territories (i.e., the liberated territories and northern Mauritania) where these remedies are found. This link has been renewed during the last two decades with refugees' re-engagement with pastoralism and (seasonal)

nomadism, in a process of recovery of Sahrawi nomadic cultural heritage and related practices (e.g., fresh camel milk consumption). To conservative Sahrawi, eghindi came to represent (1) an assertion of which food ought to be eaten and how, and which foods and food practices should be avoided; (2) a statement of value of traditional food products based on livestock husbandry; and (3) an attempt to educate youths about what is good food, what Sahrawi eat, as well as traditional Sahrawi values and beliefs. Eghindi came to be one of the elements that, according to conservative Sahrawi, define Sahrawi themselves.

Indeed, informants stress that there is no Sahrawi unaware of the existence and meaning of eghindi, and that while it can affect all Sahrawi, it is absent from and unknown to neighboring populations (e.g., Moroccan agropastoralists to the North). Eghindi is not just a sickness, but also an element of Sahrawi cultural identity. "Cultural identity" is a key concept in anthropology and refers to the feelings an individual has about belonging to a specific group of people (Hurskainen 1990). This feeling is based on shared language, culture, social organization, and ideologies, and implies the notion of contrast with other groups that have different identities (Snow 2001). At the same time, identity is not a monolithic entity, but the result of a consensus influenced by the social structure and political power of a population in a given historical moment. Thus, identities (and their symbols) are continuously constructed and re-constructed by redefining the differences between the self and the other, the cultural borders in which these differences are represented, and by dropping or adopting different key elements of identity (Nagel 1994). As recognized by Corbet (2008), contemporary Sahrawi society is witnessing multiple attempts of identity reconstruction. One of these attempts revolves around eghindi, as the expansion of its conceptualization and the refusal of salty and processed foods promoted by conservative refugees are challenged by young, progressive (i.e., Western educated/acculturated) refugees within a struggle that is both intra-cultural and inter-generational. In fact, younger refugees eat and appreciate processed, salty foods (Cozza

2010), are developing a cultural preference for salt, and are either not affected by eghindi symptoms or do not recognize/label the symptoms as such. Similar to the experience of chronique fatigue syndrome sufferers (Ware 1992), in the context of the refugee camps, the experiences of sufferers of eghindi are deligitimatized by progressive and younger refugees, who deny its existence (e.g., "I do not believe in eghindi" is a typical statement) and regard the reported symptoms as psychosomatic reactions. Some may concede the existence of eghindi but only in relation to certain products, based on personal experience, and/or in nomadic conditions (e.g., "In the refugee camps everything changed, how can eghindi still be there?," in the words of one refugee).

Further sources of deligitimation for eghindi sufferers are expatriate doctors and NGO workers in the refugee camps. With the exile, Sahrawi have witnessed a medicalization of their society based on biomedical paradigms that have been promoted and developed by the Polisario Front and international organizations working with refugees. There is a heavy biomedical presence in the refugee camps, which is charged with guaranteeing basic health care and epidemic prevention. In some instances this medicalization discouraged traditional medicinal practices and presented the nomadic Sahrawi medicinal system as backward (i.e., against progress). Some NGO workers went so far as to say that eghindi is "matter of ignorance," "evil eye," "imagination," and that "Sahrawi attribute eghindi to any health symptom that they do not know the reason of." Eghindi "believers" of all ages resolutely refuse these interpretations, and instead call upon shared knowledge (e.g., "ask anybody around if eghindi exists or not!"), recount long lists of examples drawn from personal experience, and invite disbelievers to see the symptoms with their own eyes, stressing not only the existence of eghindi but also its centrality to Sahrawi culture. Within an intergenerational struggle to define Sahrawi identity, eghindi has become more than a set of disruptive physiological symptoms. It is a cultural device used by older generations to teach

younger refugees about traditional Sahrawi food culture and the benefits of nomadic existence, relative to life in the camps.

CONCLUSIONS

We posit that the case of eghindi among Sahrawi refugees shows that in contexts of social and cultural transformation illness experiences and sickness constructions can change as much as ethnobiological knowledge about remedies to treat them. Among Sahrawi, eghindi is a cultural label for a set of pathological states experienced by nomads in the desert environment of Western Sahara. The core symptoms derive from osmotic imbalances related to salt and water consumption, but Sahrawi nomads gradually came to include other pathological conditions caused by strong flavors or smells in their explanatory model. In this way, cultural prescriptions for avoiding eghindi became a "compendium" of (primarily) food related behaviors and practices that nomads should follow. With the changes that Sahrawi society underwent during the last forty years, eghindi changed as well. As Sahrawi became sedentary in refugee camps, significant changes in food sources (particularly the displacement of traditional pastoral foods with industrial products) led to new illness experiences that were associated with eghindi. However, although eghindi as a cultural construct changed, it did not do so in a socially uniform way. Changes in pathological states and their interpretation gave rise to (1) an expanded eghindi sickness, imbued with notions of cultural identity, by conservative refugees; and (2) a denial of the existence of eghindi as a sickness by progressive refugees, with its possible existence as individual illness experiences (e.g., from few restricted agents, in nomadic conditions) and/or with a re-interpretation of associated pathological states on the basis of biomedical concepts. Eghindi, as an element of Sahrawi nomadic heritage, became embodied within a broader process of negotiation and redefinition of Sahrawi cultural identity. Refugees' views of eghindi are influenced by the

degree of engagement with the desert environment (the ultimate source of the pathological states) and with Sahrawi culture (the source of the conceptualization of those pathological states).

Further epidemiological and other quantitative investigations are needed to estimate the prevalence and exact features of eghindi episodes among Sahrawi of different socioeconomic and demographic backgrounds. Nevertheless, our findings suggest that eghindi continues to be an idiom for experiencing and managing a wide range of symptoms that are linked to improper eating and exposure to polluted environments among many Sahrawi living in refugee camps. Moreover, they provide a framework for thinking more generally about the evolution of illness experiences and of sickness constructions, which all have their own histories and are subject to change as much as any other cultural phenomena. Based on this Sahrawi example, the nature and intensity of pathological states that a population experiences can change in response to migration and displacement. This in turn leads part of the population to revise and/or abandon explanatory models that no longer fit with life experiences in the new environment, while others extend them to incorporate new causal agents, symptoms, and treatments. As such, when explanatory models evolve or devolve, intra-cultural tensions can arise between conservative groups and those who more readily adopt global (i.e., biomedical/industrial) concepts of health and disease. Experiencing an illness may transcend being a socially disvalued state and become a marker of cultural identity. Under this perspective, we suggest further qualitative studies of eghindi among the Sahrawi diaspora (e.g., in Spain and Cuba). Finally, clinicians and health practitioners working in Sahrawi refugee camps should not discount eghindi, as is too often done, as puzzling somatic complaints, refugees' imaginations, or an irrational obsession with salt. Instead, its complex, multi-factorial explanatory models should be understood as issues of

intergenerational and cultural struggle within a community, as much as they are descriptions of lived experiences of illness and disease.

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