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Medicinal Plants in Primary Health Care: A Traditional Knowledge



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Abstract

Medicinal plants are useful for curing human diseases and play an important role in healing due to presence of phyto- chemical constituents. Odisha having a rich diversity of medicinal plants and rich plant diversity has provided an initial advantage to the local people for scrutinizing various plant species for the purpose of food, medicine, perfumes and spices. The present study tries to analyze how the natural and unique medicinal plants are used for curing various diseases/ailments. It further elaborates how the extraction and characterization of bioactive compounds from medicinal plants have resulted in the introduction of new drugs with high medicinal value. Information was gathered from four villages in the district of Sambalpur. The study thus reflects the urgent need to enhance and promote the conservation and cultivation of natural resources for medicinal plants.

Keywords: Medicinal Plants, Traditional Knowledge, Health Care Practices, Healing Diseases.

Introduction

Traditional health care practices constitute a major element in every culture. The medical system prevalent in a society is a combination of traditions, beliefs, techniques, ecological adaptation, etc. This system is an integral part of the society and provides the means to the member of the society for maintaining health and preventing and curing diseases (Medhi, 1995). Ethnomedicine has been recognized as an important field of Anthropological research today. It has been defined as "those beliefs and practices relating to disease which are the products of indigenous cultural development and are not explicitly derived from the conceptual framework of modern medicine" (Pool and Geissler, 2005). Western world is accustomed to think of illness in terms of germs, viruses and assumes it to be a biological constant, a pathological condition to be verified by laboratory tests or clinical examinations. From the cultural point of view illness is quite different; it is a social recognition that a person is unable to fulfil his normal role properly and he should be brought back to normalcy (Gogoi, 2014). Rivers (1924) argued that indigenous medical practices, which might seem irrational to Westerners, were rational when placed in the wider context of local beliefs and culture.

Medicinal plants have always had great significance in culture, medicine and nutrition of societies in the world. Populations, through their healers and autonomous use, have accumulated experience and broad knowledge of them. Medicinal plants are presently in demand and their acceptance is increasing progressively. Undoubtedly, plants play an important role by providing essential services in ecosystems. Without plants, humans and other living organisms cannot live in a way living should be. Medicinal plants have undoubtedly been considered by human beings since ancient times. It can be said that before the history and since the early humans recognized and exploited the plants around them for use as fuel, clothing, shelter and food; they became aware of their properties more or less. Medicinal plants have been transformed into one of the oldest sciences in countries such as China, Greece, Egypt and India. The pharmacological treatment of disease began long ago with the use of herbs (Schulz et al., 2001).

Large human population in developing countries is dependent on plant resources for healthcare because allopathic medicine can cure a wide range of diseases, but its high prices and occasional side-effects are causing many people to return to herbal medicines which tend to have fewer side effects (Kala C. P, 2005). In last few decades, traditional knowledge on primary healthcare has been widely acknowledged across the world. It is estimated that 60% of the world population and 80% of the

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population of developing countries rely on traditional medicine, mostly plant drugs, for their primary health care needs (Shrestha PM, Dhillon SS, 2003). Therefore there is an urgent need to document the medicinal and aromatic plants associated traditional knowledge, because this knowledge orally passes on from one generation to the next; thus, have vulnerability to wiped out.

Review of Literature

Ahirwar (2005) conducted a study on knowledge and adoption of cultivation of medicinal and aromatic plants in selected categories of farmers in Sohagpur block of Shadol district, Madhya Pradesh and reported that the majority of respondents belonged to middle age group, backward class, low social contact, small size of land holding and their level of income was low. Old age group, backward class, low social contact, small size of land holding and their level of income was low. However, their attitude was positive about cultivation of medicinal plants.

Gautam P. and Richhariya G.P. (2015) reported that the tribal communities rear livestock mostly cattle, buffalo, goats, sheep etc. Most of the time animal diseases are treated by the use of local medicines extracted from the different part of the plant. All together 23 plant species belonging to 20 families are being identified having used to treat different veterinary diseases like injury, poisoning foot and mouth, wounds, stomach disorder, ant worms and bone fracture of animals these Ethnoveterinary plant species are normally collected from nearby forest or natural vegetation in Chitrakoot of Satna (M.P.)

Phondani et. al. (2016) reported that the development of a participatory approach to promote medicinal and aromatic plant (MAP) cultivation as a tool for biodiversity conservation and livelihood enhancement in Champawat district of Uttarakhand state in India.

Conceptual Contextualization

There is a diversity of knowledge and practices related to medicinal plants circulating in societies and, thus, to some extent, in the Brazilian PHC. It is of research interest mapping this diversity of knowledge and practices due to the widespread use of the term Alternative and Complementary Medicines (ACM) and/or Traditional Medicine (TM) in literature (WHO, 2011). This nomenclature brings in a single set everything that is not biomedicine, bringing little contribution to the understanding of different contexts and forms of care involving medicinal plants with their associated knowledge.

In an anthropological approach, Kleinman (1980) proposed three major sectors (or systems) of care:

1. Professional
2. Popular
3. Family care

This is based on the social relationships between healers and care "receivers". The first sector includes the professionalized healers in a given society. Thus, the professionalized ACM are grouped

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with biomedicine, in spite of significant differences between them.

The second sector includes folk healers of various types. The popular phytotherapy is practiced by non-professionalized popular experts. They are the different healers (midwives, folk healers, traditional healers), with theories, cultural and social aspects and with convergent or divergent worldview from each other. Their knowledge and practices are based on a holistic approach, inherited from family members, a "gift" or learning from another healer. These specialists establish a strong connection with the user due to community knowledge and/or lack of access to biomedical care.

The third one refers to family care and their supporting networks, generally supportive and without payment. Family phytotherapy, which often does not have written records of practice, refers to the autonomous and informal practices of phytotherapy (homemade medicine) which fall into the user's social support network.

Each sector has its own characteristics (where different notions, knowledge and practices in relation to health and disease are used), but they are interrelated.

Study Area and Methods Used

The study was undertaken in four different villages, namely: Chamunda, Bhatli, Attapara and Laurabira of Jujomora block of Sambalpur district, which is located in the western part of Odisha. The study involved intensive explorations and critical study of specimens for the last one year. It involved meeting the local council representatives who helped in identifying herbalists and elderly people known to treat patients using herbal medicine. The meetings with local council representatives helped in making priorities when choosing respondents during the survey. Using open interviews, semi-structured questionnaires, homesteads and individual herbalists were visited and asked to provide the following for each of the medicinal plant that they were using to treat diseases: local name, medicinal use parts of the plant used, mode of preparation and administration and whether the plant is used singly or with other plants in combination. Focus group discussions were also used to obtain extra information. Transect walks in and around the forest were done to identify some of the plants purported to be used to treat ailments.

The field trips were organized in such a way so as to cover all the villages of the studied area at regular intervals in different seasons. As a result, it became possible to record the seasonal variations in the vegetation, including distributional patterns and collect most of the plants in different developmental stages of their life cycle. Field observations on phenology, habit, habitat, local names, local uses, frequency of occurrence, etc. were recorded in the field notebooks at the time of collection and the collected specimens were tagged with field book numbers. Information was gathered basically from the older generation.

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Objectives of the Study

Keeping the above perspective in mind the present study makes a humble attempt to:

1. Give an account of ethno-medicinal practices prevalent in the village
2. Discuss the importance of medicinal plants and their uses in healing different disease

Discussion and Results

Religious beliefs, practices and institutions have been important parts of the health care sector throughout the centuries. Faith-based curing and healing of some serious health problems such as mental illness and various other visible bodily and psychosomatic diseases are witnessed among many organized religious denominations (Howard and Janet, 1992). Religious specialists as healers and curers are in the forefront of dealing with the problem of health and disease in almost all societies, and particularly in traditional societies (Scupin and DeCorse, 1995). Health professionals need knowledge of culture and cross-cultural relationship skills because health services are more effective when responsive to cultural needs. The most important fact about traditional medicine is the way it is integrated into a whole culture. The concept of health and disease are basically biological but it has a close relation with the socio-cultural system of a society. Every culture has their own concept of disease and illness and some specific ways of coping with it.

The studied area is rich in plant diversity and local inhabitants are using medicinal plants traditionally for curing different ailments. So, preservation of the indigenous knowledge of plants used in traditional health care is very important. People utilize different parts of the plant for medicinal purposes. The people of the sample area possess good knowledge of herbal drugs but due to modernization, their knowledge of traditional uses of plants may be lost in due course. So it is important to study and document the uses of plants by different local communities. However, the local indigenous knowledge on medicinal plants is being lost at a faster rate with the increase of modern education, which has made the younger generation to underestimate its traditional values. In addition the increase in population growth rate would result in the intensification of agriculture in marginal areas which would lead to deforestation with decrease in number or loss of medicinal plants in the wild (Pankhurst, 2001). The substantial increase in the popularity of plant-based medicine for a variety of illnesses and symptoms is reported recently which reflects that medicinal plants had continued to be used extensively as a major source of drugs for the treatment of many ailments. Herbal utilization in our country has a long tradition (Dimitrova, 2010; Nedelcheva, 2012). This traditional knowledge has been documented during 19th and 20th centuries by teachers, University professors, naturalists, folklorists and physicians (Kozuharova et al., 2013).

In the studied area, forests have been classified and identified with a name given by local

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communities based on certain characteristics. Forest is considered to be the abode of many supernatural entities both benevolent and malevolent. For example, *Vim-Kunj* is a name forest where local communities worship Lord Shiva under a banion tree and commonly known as *Vim-Baba*. Another forest is called '*Ghipana*'; a medium size forest where *Maa Ghipanna* (Goddess) is worshipped. Second criteria of classification and nomenclature of forest is availability of particular variety of trees. The *Kalpa* forest is another name in which *Kalpa* trees are found in large numbers. *Amjharan* is another forest which is the combination of mango trees and a perennial source of river. People also believe that Lord *Shiva* and Goddess *Parvati* live in this forest. A third criterion is appearance of the mountain from distance. In this category, *Makut Pathar* is a rocky mountain and the peak of the mountain looks like a makut (king's crown). *Bhaluduel* is another name of the forest area where bears are usually found.

Classification and Nomenclature of the Forest

Besides above mentioned names, varieties of other names are Tethei-tanger, Beja-Beria, Gudia-Katta, Nua-madda, Padibaha, Damburu-bada, Gochar, Dangapather-Nal, Gartialine, Jhar-berna, Pepal-dahala, Tamir-dungri, Appu-dungri, Galchira-kata, Moral-Dungri, Dehir-jungle, Jarang-jungle, Saj-bahal, sadhu-dera, Bag-lad, Kachher, Chhamunda-kop, Jam-dera, Kalara-dungri, Seyan-jhuri, Haphu-katta, Dumuri and Galchira. In the sample villages, different God & Goddesses are also worshipped by villagers in different forests such as *Churanrakas*, *Darankhapa*, *Baandurga* and *Maali*. Terrifying information related goddess *Darankhapa* was revealed during the fieldwork. Every year a pregnant lady is affected while walking by the place of *Darankhapa*.

Edible Fruits, Leaves & Mushrooms

The study area is surrounded forests of different nature from all the directions. Different fruit bearing trees are found on which communities living nearby depend for supplementary food. The mango, custard apple, neem, guava, karanj, sal, black berry, some local term (sambalpuri) like "buro, char, kendu, aam, maya, badhel, kusum, anla, harida, bahada, pitalukanda, tole, kathaukohili, sargimanji, theko, taal, jam, kuler, tetel, kankuda, kurdu, dumer, venue, baul, jhal, kunduru, muriafal, panas, beel etc are seasonally consumed by the people. In this region different types of edibles leaves are found; such as bhal-vadiria, Khar-khas, kuler, leeper, mamer, fandi, bhadbhadia, bhuinli, faan, kachher, dhiu, chakanda, badal, katei, seriyali and kena.

The local term of mushroom is "Chhati". Generally mushrooms are found in rainy season. Knowledge on mushroom consumption is important because few varieties are poisonous in nature. The edible mushrooms in the area are halden chhatu, balchhatu, pual chhatu, deyan, behedden, rugda, chhuamadda, budhabudhi, bhudo-maula, benua, baunsa, mairduma, marang, patda, bharundao, antha, khejur and bhad-mahula. Usually mushrooms are collected by the women, but sometimes men and children also participate in the venture. Hunting was

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important part of subsistence in the area. At present open hunting expedition has reduced as per government restriction. But sometimes they go for hunting maintaining the secrecy. They hunt forest animals like sambar, barah, kheria, kukura, deer, kutura, etc. Traditional hunting implements are bow and arrow (chalkana), but net and guns are also used by the local people.

Seasonally Available Forest Produces

Months	Collections of Forest Produces
Baisakha (April-May)	Mahul, kendu, neem, jam, aam, char, sargi, jackfruit, palm, date, papaya, tamaraind
Jestha (May-June)	Kusum, leafs, etc
Asadha (Jun-July)	Pualchhatu, saga, balichhatu, tole, fruits
Sravan (July-August)	Termind, kanda, pitalaxe, saga, buro
Bhadrava (August-September)	Green, Leaf
Aswina (September-October)	Pitalukandu, Tal kandu
Margasira (October-November)	Mushroom, Kanda, green, leafs, fruits
Pausa (November-December)	Mushroom, woods
Magha (Dec-Jan)	Woods, roots, Mushroom
Faguna (Jan- Feb)	Buro, Mushroom, Roots, woods, greens,
Chaitra(Feb-Mar)	Flowers, Fruits, Mahul

Amla tree is used for the preparing "khatuli" for "Goddess Laxmi". Kaha woods are used for a special purpose for making vehicles' Chesis stand. Rengal cubes are used in business purposes. They sale Rengal cubes in local market. People use rengal cubes for tooth brush. The Kendu leaves are collected from forest for the preparation of "Biddi". Generally female members of the village go to the forest for

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collection. Turmeric leaves are used for making cake. Another secondary occupation of the old lady of the village is for making khalidana from sargi leaves. They sell *khalidana* in local market. The people of Chhamunda village make 'mat' from date leaves.

A flower called *gerel ful* is used for cooking purpose. *Mahul* (mohua fruit) is used in multiple purposes like for making cake, bara & cow food. They also prepared wine from mahul flower. They prepare oil from sal seeds. In past they used to exchange *Dhatuk* flower with salt in their local market. *Kurel* flower is used in *Nuakhai* festival. They also use *Aparajita* flower & *Katha Champa* in worship purpose.

Mahul Tree

Wine is prepared from the flower of mahua tree. This wine is called in the local term as "*mahuli*". The mixture of cow excreta and mohua fruits is used as manure. In different rituals like death rituals, birth rituals they offer '*Mahuli*' to their ancestor for solace.

Banian, Peepal & Saltree

There are large in number of sal tree and banyan trees. The leaves of bacan, peepal and sal flower is offered to the Gods and goddess in the *Nuakhai* festival.

Dhatuk Tree

The *Dhatuk* is found in the village forest and its flower is very expensive in all area. Earlier they used to exchange flower with salt. Middle man used to bring salt to the village and exchange it with *Dhatuk* flower. Even today people don't know the actual price of the seeds and what is made out of it.

Forest and Knowledge on Medicinal Plants

Ethno-medicine plays a major role in the primary health care. Several types of primary and complex diseases can be cured. In the table below detailed discussed about the preparation and application of the ethno medicines for different types of diseases are presented.

Name of the Plants and it's Medicinal Uses

S. No.	Name of Disease	Name of the plant	Part of The Plant Used	Mode of Application
1.	Irregular Periods	Mango & Ashok tree	Seed /Bark	A mixture of grinded dry mango seeds, ashok bark and methi is consumed
2.	Malaria	Gangasiuli	Leaf	A mixture of gangasiuli leaves with the <i>golmaricha</i>
3.	Cold Cough	Arjun	Bark	Arjun bark is boiled and taken with milk, tulsi leaves along with hot ghee.
4.	Breathing problem	Teva	Fruit	They coated cow-dung on ginger and peepal and burn it after burning they pick out the fruit and take that.
5.	Acidity	<i>Golmaricha</i>	Seed	5 <i>golmaricha</i> (black pepper) and with hot water is consumed
6.	Warm	Birang	Fruit	Grinded birang fruit is taken with cow urine.
7.	Vomiting during pregnancy	Amla	Fruit	Amla fruit grinding with kismis is taken.
8.	Diabetes	Mango, Neem, Black berry, Emli etc.	Leaf / bark	Boil the gangasiuli leaves, mango bark, neem bark, black berry and emli and make juice taken it gap between 4 to 8 days.

9	Knee swelling back pain	Custard apple tree	Leaf	Grinding custard apple leaf and boil and make a paste then applied.
10	Headache	Ruhuria	Leaf	Grinding Ruhuria leaf and applied.
11.	Black hair	<i>Bhuinkadamabamu ddi sag</i>	Leaf root	Juice of bhuin kadamba, with / root taken. Make juice Bhuinkadamba with mudhi sag root is taken
12.	Loose motion	Karan tree	Bark	Paste of karan bark is taken
13.	Teeth pain	Baul tree	Bark	Boil baul tree bark taken.
14.	Body pain	Besan tree	Bark	Paste of besan bark is taken.
15.	Joint pain / loose motion	Ruhen tree	Bark	Paste of ruhen bark is applied
16.	Diarrhoea	----	----	Hengu along with salt is taken.
17.	Pruritos proper bleeding in period fat infection	Khajhuri Tree	Bark / seed root	Paste of Bark is taken for prorates juice of root is taken for proper bleeding in period oil of kajuri seed used for fat infecting.
18.	Fat	Chakanda Green	Leads	Powder of dry chakanda leaf is taken.
19.	Chicken pox	Neem/ Turmeric		Paste of neem leaf along with turmeric is applied and bath with neem water.
20	Strength	Mahul	Flower	Dry of mahul flower and boiled kanda is taken.
21	Loose motion	Sastarbhejri	Root	A paste of sastarbhejri root with water is taken.
22.	Jaundice	Beyanty	Root	A paste of beyanty root is taken.
23.	Strength of child and cow	Pataikumuda	Fruit	A paste of pataikumuda fruit and make it cake and then taken.
24.	Jaundice	Patwan	Bark	A paste of patwan barks along with rice and burn it with sargi leaves is taken.
25.	Bone facture	Arjun	Bark	A mixture of ghee, sugar and milk is taken
26.	Blood vomiting	Arjun	Dark	A powder of Arjun bark is taken.
27.	Mouth infection	Arjun	Dark	A paste of Arjun bark along with kusum oil is taken.
28.	Diabetes	Neem	Leaf	Neem leaf is taken, it is not good for young persons.
29.	Loose motion	Neam	Bark	Boiled neem bark is used.
30	Cough & feet pain	Pingu	Seed	Oil of pingu seed used with hot clothes is applied.
31.	Reducing red circle face of new born baby	Atebar tree and pig's fat	Seed	Mixture of atebat seed along with pig's fat is applied in effected area of the face.
32.	Cold	Harida	Fruit	Burn harida fruit and is taken
33.	Belly cold	Bija	Root	Paste of Bija root is taken.
34.	Cold and white discharge	Chhabatri tree	Root	A paste of Chhabatri root is taken.
35.	Jaundice	Hehendi	Leaf	A paste of mehedi leaf is taken.
36	Skin disease	Kusum	Bark	A paste of Kusum bark is applied in effected area.
37.	Hair grow	Kusum	Seed	An oil of kusum seed is applied in hair for grow black and with crowed hair.
38.	Worn	Date	Leaf	A mixture of boiled date leaf with sugar to taken in empty stomach.
39.	Teeth pain	Date	Root	Boiled date root gurgling regularly
40	Pimples	Saptapheni	_	Use saptapheni milk on pimple area.
41	Headache	Saguan	Wood	A paste of saguan wood applies on forehead.
42	Hair grow	Saguan	Seed	Oil of saguan seed is applied on hair.
43	Blood pressure	Munga	Leaf	Juice of munga leaf along with water is taken.
44.	Kata gha	Arjun	Leaf	A powder of Arjun leaf is taken.
45.	Stomach disease	Ginger	_	Ginger juice along with milk is taken.
46.	Skin disease	(ada)ginger	_	A paste of wet ginger along with molasses is taken.
47.	Normal bleeding in period	Banana tree	Flower	A paste of baana flower along with curd is taken.

48.	Snake bite	Kaincha Tree	Fruit	A powder of kaincha fruit is applied.
49.	Knee pain	Kanchhan tree	Bark	A paste of kanchan barks and then warms it and applied.
50.	Constipation	---	---	Paste of curd along with turmeric is taken.
51.	Headache	---	---	They eat turmeric powder with drinker water
52.	Ghimiri	---	---	After boiling of turmeric, boil water along with honey is taken.
53.	Belly scar cures after pregnancy	Forest Basil	Seed	Paste of forest basil seed is applied in belly.
54.	Healthy baby	Peppali	Fruit	A paste of peppali fruit with oil is applied on boby.
55.	Diabetes	Bel	Leaf	Leaf powder along with honey.
56.	Joint pain	----	Oil	They used Rana snake oil in pain body parts.
57.	Cough	Basanga Tree	Leafs	Grinding Basanga leaf and make paste along with water and paste is taken.
58.	Remove Poison from body	Jada/Gaba	Leaf	A juice of jada leaf is taken
59.	Sterile	Peepale	Fruit	Powder of peepale fruit is taken in empty stomach.
60.	Vomiting	Bhursunga	Leaf	Powder of Bhursunga leaf along with water is taken daily
61.	Malaria	Vada Vadlia	Leaf	Cooking of vada vadlia sag and is taken
62.	Weakness	Munga	Leaf	They used to cook munga leaf and eat
63.	Eye diseases	Munga	Leaf	Juice of munga leaf taken with honey and also neem juice is taken in eye
64.	Fever	Gangasiuli	Leaf	A paste of 4/7 leaf and Pepper (golmaricha) is taken in a day
65.	Diabetes	Gourd Tree	Fruit	A Juice of gourd fruits is taken.
66.	Hair fall	Onion	-----	A juice of onion is applied in hair
67.	Black spot/ Dandruff/Skin- glow/Pimples	Alovera	-----	A juice of Alovera is applied in face and hair
68.	Face glow/ Pimples	Chandan Tree	Wood	A paste of Chandan and turmeric powder is applied in face
69.	High Blood Pressure	Garlic	---	They eat 4 garlic For curing High blood Pressure
70.	Fat grow	Banana	Fruit	Eat 2 Banana is taken in empty stomach
71.	Sugar	Blackberry	Seed	A grinding of dry seed with water is taken.
72.	Teeth pain	Kamini Tree	Leafs	A boil water of kamini leaf is gurgling
73.	Diabetics	Ladies Finger	---	Two Pieces of ladies finger drench and drink that water
74.	Periods right time	Mango Tree/Ashok tree/Methi Tree	Seed/Bark & methi	They eat dry mango seeds , and also make a paste of ashok bark with methi
75.	Dandruff	Amla Tree	Fruit	Paste of amla fruit is be applied On The head.

Among plants parts, leaves were used substantially by the local inhabitants. The probable reason may be because leaves are more available and accessible plant part and contain good amount of secondary chemicals which has potential to cure the target ailments. It was noted during the study that though most of the inhabitants have good accessibility to visit physicians or the clinics but they still use medicinal plants due to their efficacy and lesser side effects. This confirms the importance of these medicinal plants as renewable resources by local inhabitants in the study area. According to Konno (2004), easy accessibility, efficacy on treatment and affordable cost in getting health services are main reasons in preferring traditional medicine to modern medication. Medicinal plants are the main, often only

source of traditional medicine for the rural population and are of high demand in the health care systems of this population when compared to modern medicine. Traditional healers were found to play an important role in the primary health care system of the rural people as they treat resource people who had little access and could not afford the cost of modern medication. It was revealed that a significant number of informants of the study area used medicinal plants to treat at least some ailments and this shows dependency on the traditional primary healthcare practices among indigenous communities which is believed to be evolved over a long period of time based on necessities and experiences.

Conclusion

Medical system is an integral part of a culture. Every culture develops its own medical culture. The efficacy of a medical system is not easy to evaluate. In the 21st century modern medical system has developed to its peak but the potential and use of ethnomedicine still remain very effective. Ethnomedical practices involve some kind of religious activities which have great social, psychological, and even physiological effects. In a broad perspective, phytotherapy can and should be considered as knowledge and practices interaction field that values: cultural resources, practices and local knowledge, natural resources and biodiversity preservation, users interaction with both nature and healthcare team professionals, besides enriching heteronomous and autonomous therapeutic possibilities. Thus traditional, popular and lay knowledge can be seen as an opportunity to approach the health professional with the user. In this context, the principles guiding the healthcare relations should be solidarity, reciprocity, respect and mutual appreciation. Ethnomedical practices can make important contributions to future health care and documentation of traditional health care practices would be very useful for the benefit of mankind.

The lack of accurate translation and interpretation of the texts and research findings on plants by scientists around the world is one of the main challenges in this field. In fact, to realize the effective integration of plants into a medical system, researchers and practitioners should be trained in both modern and traditional medicine in the use of plant compounds. In addition, to build credibility for the use of plants in conventional medicine, the empirical arguments should be converted into evidence-based arguments. Finally, several questions about safety, accurate dose, duration of treatment, side effects, acute and chronic toxicities as well as the standardization of herbal medicines and natural products should be answered. If these issues are resolved, medicinal plants can be used as a safe, effective, and affordable form of health care.

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