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Common used Herbal Plants for Various Health Problems at Mlangali Village, Ludewa District, Njombe Region

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Abstract: Even though it is known in every rural community in developing countries there are common herbal plants used for managing various health problems occurring in the community, limited studies if any have been done to establish the vernacular and scientific names and for which specific health condition being managed by these common herbal plants. The present study aimed to explore the vernacular and scientific names and for which specific health conditions common herbal plants are used to manage by non structured interview to selected key informants at Mlangali ward, Ludewa district, Njombe region, Tanzania. The herbal plant specimens and ethno-medical uses were collected from the field work and compared with same herbal plants found in literature review. Thirty common herbal plants with their uses were identified. Of these 13 (43.3%) common herbal plants were reported by 18 (60%) respondents and these were assumed to be the common herbal plants at the ward. The vernacular names from the community and later scientific names were identified by the botanist at the Institute of Traditional Medicine. Nowhere was observed these common herbal plants uses were documented at the ward. All the identified herbal plants were used to manage ill health conditions that were occurring at the ward. The study noted that there was threat of those common herbal plants with the increasing population and there was no effort of establishing sustainable conservation. Comparing with those found in literature review, the findings revealed some herbal plants were used worldwide in developing countries for treating the same ill health conditions. Some had different uses. As a whole most herbal plants had multiple uses on managing ill health conditions. Effort is needed to document and conserve sustainable the common herbal plants for future use and scientific investigation for new drug development.

INTRODUCTION

The use of herbal plants for treating diseases/illness is probably the oldest existing methods that humanity has used as an impact of humankind creativity to try to copy with ill health conditions[1-3]. These plants have been used over millennia for human welfare and continue even today on the onset of any health problem in rural areas both developed and developing countries[1-3]. These herbal remedies are used before consulting health professionals (traditional and conventional health practitioners)[4, 5]. Some of these herbal remedies are known by the community and acts as first aid on the onset of the health problems even today in rural areas[4-6]. These known herbal plants by the community might be falling in the category of popular sector on healthcare that comprises the lay, non-professional domain where illness is first recognized and treated using natural resources[7]. It is in this sector where selfcare takes place[5, 7, 8]. Popular sector healthcare remedies in rural African countries include remedies that families have passed down over several generations and are known by many people in respective community[9, 10]. Utilizing some herbal remedies prohibits certain behaviours in the community; in other words, it is also a cultural control mechanism of unwanted behaviours in the community[9, 11-13]. Herbal remedies are woven in cultural tradition settings and has little grounding in scientific knowledge because nobody was interested to evaluate their value in scientific terms[11, 12].

In developing countries (Tanzania included) herbal remedies are used even in places where health facilities are available[1, 5, 6, 14, 15]. It is in rural area where more 60-80% of the population of developing countries uses Traditional Medicine (TRM)[1]. However, when these herbal remedies do not respond to the illness/diseases, then two options takes place[14, 16, 17]. Patients or relatives go to consult Traditional Healers (THs) for the general health problems and for reproductive health problem go to consult Traditional Birth Attendants (TBAs)[11, 16-18]. The other options is going to health facilities but for this options depends on distance to health facility, availability of the bus fair and consultation fee (user charge), cost of laboratory investigation and money to buy drugs[4, 5, 14, 16, 17]. Most of the people in rural areas do not have money for such charges and ends to Traditional Health Practitioners (THPs)[5, 19]. THPs include THs and TBAs.

WHO[1] shows there is an increase global on use of herbal remedies over past few years. The possible reasons for the increasing use of herbal remedies are inadequate decentralization of health services, isolation of some rural communities, shortage of drugs and other medical supplies, user charges, waiting period to see the medical personnel, lack of competent medical personnel, abusive language from medical personnel and persistence of traditional beliefs regarding pathology resistant of diseases to conversional medicine[1, 14, 19, 20]. The importance of TRM on health cannot be ignored because of increasing number of people who are using it worldwide[1, 6]. Even though these herbal remedies are commonly known by the respective communities and have been used for years; few if any of these common herbal remedies used in communities are known to scientists and being evaluated for safety and efficacy for humankinds as claimed[6]. In order to have high quality of livelihood worldwide including the absence of abject poverty in developing countries, there is a strong need to know the scientific names of common herbal plants that are being used by many people and subject them for evaluation of safety and efficacy in order to be sure that the herbal remedies taken are safe for human being. Above all this exercise can lead to discovery of new drugs to resistant diseases in the conventional drugs.

Conceptual framework: Ill health conditions have been on existence since the emergence of humankind and are the foremost health problem globally up today[1, 6, 9]. As opposed to other living things, humankind has been born creative in finding solutions to health and other socio-economic problems encountered in daily life, by using natural resources available to master his living environment. Natural resources are naturally occurring substances that are considered valuable in their relatively unmodified (natural) form and supplied by nature. A natural resource is often characterized by amounts of biodiversity and geodiversity existent in various ecosystems. Natural resources are naturally occurring substances that are considered valuable in their relatively unmodified (natural) form and supplied by nature. A natural resource is often characterized by amounts of biodiversity and geodiversity existent in various ecosystems (Webster on line dictionary). Plants are part of biodiversity. On health, the most important resources on healthcare are herbal plants which are commonly consumed as therapy to alleviate suffering or cure illness/diseases suffered[1, 21, 22]. Herbal plants include crude plant material such as leaves, flowers, fruit, seed, stems, wood, bark, roots, rhizomes or other plant parts which may be entire, fragmented[22]. Finding the right herbal remedy for specific health condition, at the beginning, the process might have been try and error or by observing birds and animals eating such plants, through dreams, intuitive or spiritual visions, etc[9, 16, 17] and hence subject potential herbal plants to scrutiny for their safety and efficacy as remedy. These activities likely gradually

led to discovery and establish herbal plants that could alleviate/treat health problems occurring in their respective community. These established herbal remedies were/are cultural controlled through beliefs and taboos and were product of culture. In any community not all knowledge is made public[9, 16, 17]. In the same manner some herbal remedies in community, especial on the knowledge of utilization was/is restricted to special people and in most cases were/are THPs and elderly people of specific clan that were entrusted with that knowledge. Other herbal remedies, on the other hand, were/are common and their utilization was/is known to many people in the community. These herbal remedies were/are used immediately on the onset of the illnesses/disease as a first aid and provision of primary healthcare. These were the herbal plants, this study was interested to know through in-depth interview at rural village specifically on:

- Vernacular and scientific names of common herbal remedies used by many people on the onset of the health conditions
- Specific health conditions these common herbal plants clamed to alleviate/treat
- Compare information of the same plants collected in this study and that found in literature and specific health conditions claimed to treat

The ultimate goal was to come with a list of vernacular and scientific names of the common herbal plants with their specific health conditioned claimed to alleviate/treat by using the data collected at Mlangali ward, Ludewa district, Njombe region.

MATERIALS AND METHODS

The study was a qualitative study and was carried at Mlangali ward, Ludewa District, Njombe region. Mlangali ward was randomly picked among the 22 wards of Ludewa district as case study. The ward has a total population of 12,977 and of these 53% are women. The average size of the household was 4 members. The main occupation of these people in this ward was peasant farming growing food crops (maize, beans, wheat) and cash crop (coffee) with few mainly being indigenous cattle and goats. At time of the study most of youths were engaged in gardening mainly on vegetables, onions and tomatoes. Most of cultivation was done by ox plough. The main means of transport to health facilities were either by bus or by bodaboda (motorbike). The common health problems in this village were pneumonia, headache, diarrhoea, flue, coughs, respiratory diseases, reproductive health problems to women during pregnancy period, tuberculosis and in recent years AIDS both to youths and old people. It was one the wards in the district which highly infected with HIV/AIDS.

The target population of this study was old people and THPs who had knowledge of common herbal plants for treating health problems. The sample size of the study was purposefully sampled with assistance from village executive officers and other government officers in respective villages. Only those who have lived more than ten years in the village and could express clearly on the knowledge of the herbal remedies common used and for which specific illnesses/diseases and willing and consented to participate in the study were picked for the study. An interview guide was prepared covering following areas; common herbal remedies used and illnesses/diseases claimed to treat and if there were a contra indication for users, especially to whom, availability and who were the prescribers.

The reported information was qualitatively analyzed using sociological and anthropology methods by researcher. Codes were identified and opened as shown in Grounded Theory procedures and Techniques[23]. Only those remedies reported by 60% of the respondents were assumed to be common herbal plants that were used on the onset of the health problems on the study area. In the process of analyzing the information, axial coding was used. Data were put according to the identified categories and subcategories and in this way making connection between the central idea of the research and categories and subcategories. The specimens of herbal plants were identified by botanist at the Institute of Traditional Medicine. The analyzed reports were re-screened several times for ensuring important information was included in the report. The analyzed data were given to other independent researcher expert on qualitative study for evaluation and validation of the analyzed data and give comments. The results and including valid comments from the reviewer were summarized and are presented below.

RESULTS

Socio-demographic characteristics of the participants: The 15 informants were sampled for this study and of these eight were males and the rest were females. Among the participants four were THPs -two being THs and three were TBAs. The age ranged between 40-60 years and above. All respondents were from Wapangwa ethnic group and ten of them had primary education and the rest were illiterate. The sampled informants had a wide knowledge of the common herbal remedies being used in the wards on various health conditions.

Common herbal remedies used by many people on the onset of the health condition: A list of 30 herbal plants with their respective specific health conditions of the said to be common herbal plants that were used to alleviate or cure was obtained. The 13 (43.3%) of these herbal plants were being mentioned by 18 (60%) informants and were assumed to be common herbal plants in the study area and are shown in Table 1 with the health problems they were used to manage. Some of these medicinal plants had the names of the diseases or ill health conditions. For example "mkoda kwa" means medicine for named health problem. The common herbal plants mentioned were related with health problems that were occurring at the ward like cough, dysentery, diarrhoea, pneumonia, HIV/AIDS symptoms, infants' heath problems and respiratory diseases. Some of the herbal plants had multiple uses and sometimes were in combination of two or four herbal plants. The parts of herbal plants commonly by order as mentioned by the respondents were fresh, leaves, roots, barks. None of the respondents mentioned stem to be used in the treatment.

Table 1: Common herbal remedies used in the Mlangali ward compared to reviewed literature

Description on medicinal plants	Field work results on medicinal use	Medicinal use of the herbal plants in literature review
Botanical name: *Rumex hymenosepalus* Family: *Polygonaceae* Vernacular name: "Mdoda" "Mdoda" is a perennial growing to 100 cm (31/2 ft). The flowers are hermaphrodite (have both male and female organs) and are pollinated by Wind. Herb ca. 1 m tall, growing on farmland	Leaves Cooked together with leaves which have a bitter and sour taste, like *Solanum* sp., to reduce the sourness Stems and leaves Are used to treat diabetes, pneumonia and stomach ache Roots Pounded and smeared on the wounds., treating sexual transmitted diseases. And preventing diarrhoea	Ethno medicine: A tea made from this plant is used to treat colds Leaves An infusion of the stems and leaves used as a wash for sores infected cuts Roots Are astringent,. An infusion used in the treatment of diarrhoea as a gargle to treat coughs and sore mouths and throats, chewed in the treatment of coughs and colds, dried, powdered roots used as a dusting powder and dressing on burns and sores[25, 26]
Botanical name: *Dissotis rotundifolia* Family: *Melastomataceae* Vernacular name: "Ling'eng'ena" Shrub growing in forests and open woodlands. "Mng'enge'na" is one of endemic plant and is perennial shrub herbal plant	Roots Boiled in water and taken oral to prevent and treating diarrhoeal during hot period	Ethno medicine: Leaves of *D. rotundifolia* Used ethno medically across Africa[27], mainly for the treatment of rheumatism and painful swellings, relieve stomach ache, diarrhoea, dysentery, cough, stop abortion, conjunctivitis, circulatory problems and venereal diseases[28-30] treatment of bilharzias rheumatism, yaws and as an antihelmintic[31] Libratory investigation: Hot water extract of D. rotundifolia given orally is used for hookworm infestations[31]. Ethanol extracts of D. rotundifolia demonstrated antimicrobial activity against clinical strains of selected microorganisms[27] Potential for application in the treatment of diarrhoea, thereby justifying its usage across Africa[27, 31]
Botanical name: *Eucalyptus globules* Family name: *Myrtaceae* Venacular name: "Mlingoti" "Mlingoti" is perennial tree and in Tanzania it grows successfully at altitudes above 1600 m and latitudes <100 S and is among the major species adopted for planting by most small-holder forest practitioners in Tanzania[24]	Leaves Used for treating flue Also used was in one of the dispensaries in the ward for treating flue	Ethno medicine: Eucalyptus leaf is used for infections, fever, upset stomach and to help loosen coughs, respiratory tract infections, whooping cough, asthma, pulmonary tuberculosis, osteoarthritis, joint pain (rheumatism), acne, wounds, poorly healing ulcers, burns, bacterial dysentery, ringworms, liver and gallbladder problems, loss of appetite and cancer[32] Oil is also a good pain reliever for sore muscles and arthritis pain Credited to its antispasmodic, anti-inflammatory, antibacterial, antiseptic, decongestant and other medicinal properties May be chewed to strengthen the teeth and harden the gums, used as natural insect spray Laboratory investigation Can be used to treat respiratory and sinus infections, viral infections (herpes), Candida, acne, bronchitis, rheumatism and arthritis, muscle aches and pains, diabetes, measles, migraines, ulcers, wounds, ear inflammation and iris inflammation. Dilute 50:50. Can be used as a dietary supplement. Approved by the FDA as a Food Additive (FA) or Flavouring Agent Contra indication: Not advised for children <6 years of age

Table 1: Continue

Description on medicinal plants	Field work results on medicinal use	Medicinal use of the herbal plants in literature review
Botanical name: *Psidium guajava* Family: *Myrtaceae* Kiswahili name: "Mpera" Mpera is small perennial plants that can grow up to 3 m tall with greenish-brownish smooth bark. The round globular bayabas fruit starts as a flower and is usually harvested and eaten while still green. The fruit turns yellowish-green and soft when ripe	Leaves Pounded and soaked in water for treating diarrhoea, fevers	Ethno medicine: almost all of the parts of the plant have medicinal qualities natural cure for fevers, diabetes, epilepsy, worms and spasms[33] Leaves decoction Effectiveness to cure several ailments including treatment of uterine haemorrhage, swollenness of the legs and other parts of the body, chronic diarrhoea, dysentery, gastroenteritis, inflammation of the kidneys, cleaning and disinfecting wounds used as astringent, wash for uterine and vaginal problems and is good for ulcers[34, 35] Laboratory investigation Antiseptic, astringent & anthelminthic Kills bacteria, fungi and ameba Used to treat diarrhoea, nose bleeding For hypertension, diabetes and Asthma Promotes menstruation[33] Fresh leaves Are used to facilitate the healing of wounds and cuts, prevent infection toothaches The fruit, contains nutritional values with a very high concentration of vitamin A and vitamin C.[33] Caution: *Psidium guajava* can cause constipation when consumed in excess[33]
Botanical name: *Vernonia colorata* (Willd.) Drake Family name: *Compositae* Venecular name: "Lifufundu" "Lifulufundu" is perennial plant about 1-2 m tall, growing on open woodland	Leaves Pounded, soaked into water and filtered/squeezed to obtain liquid. The decoction is used for abdominal pain and disturbed stomach and diarrhoea Drips of juice from the pounded leaves are applied on wounds	Ethno medicine: In Africa, Vernonia colorata is well known in treatment of diabetes, skin rashes and acute hepatitis commonly used in the treatment of schistosomiasis, the epile ptiform seizures, fevers, diarrhoea and hypertension[36, 37] Laboratory investigation showed antimicrobial tests prove that *vernonia colorata* leaves extract can develop bactericidal activities on resistive gram-positive and gram-negative germs such as *S. aureus* resistant to methicillin and *P. aeruginosa* resistive to *ceftazidime* and *imipenem*[38]
Botanical name: *Stegonotaenia araliacea* Hochst (= *Peucedanum araliaceum* Benth. and Hook. f. ex Vatke) Family: *Umbelliferae* Vernacular name:"Liniongambembe" Shrub growing in forests and woodlands .	Leaves Soaked into hot water; then used for massaging the patients who has paralysis Leaves and the bark Decoction is drunk for treatment of abdominal pain, diarrhoea, sore throat is used for treating AIDS. sexual transmitted diseases, infant and children illness particularly general weakness and loss of body weight Stem with its leaves Used as snake repellent Roots The extract in hot water of roots	Leaves Are rubbed on wounds as general disinfectant[39] Bark Is chewed for fever decoction, prepared by boiling the bark for one hour, is added to milk and administered orally to adults as a remedy for stomachache/dysentery[39] Twigs Are used in dental care as toothbrushes and bark used in preparing a medication for a heart complication[39] Roots and bark Used to cure sore throat[39] Roots Are used in treating snake bites and the tree trunk reported to have snake deterring activity, The roots are used in treating painful chest conditions[39] Laboratory investigation Saponins isolated from the leaves of *S. araliacea* have shown antileukaemic activity[39]
Botanical name: *Parinari curatellifolia* Family: *Chrysobalanceae* Vernacular name: "Lisaula" Tree growing in open woodlands; fruits egg-like, with yellow inner layer	Leaves Young leaves lisaula and mng'eng'ena treat any fever especially to children under fivers Roots Extract in hot water of lisaula is drunk to treat chest pain and sexual transmitted diseases Fruit Pulp and the nuts are edible. The nut is roasted, then ground: the creamy, oily mass is added to food as spices	Ethno medicine: Is used in traditional medicine for the treatment of pneumonia, chataracts, earache, wound infections, fever, dressing of fractures and dislocation[40, 41] Laboratory investigation Phytochemical screening revealed the presence of anthraquinones, tannins, saponins, flavonoids, cardiacglycosides, terpenoids and carbohydrates Antibacterial activity of the extracts may be at tributable to the presence of these compounds in the extracts[41, 42] Bark

Table 1: Continue

Description on medicinal plants	Field work results on medicinal use	Medicinal use of the herbal plants in literature review
		The extract found to be potentially useful in the treatment of the species of snakes that causes increase blood pressure, tachycardia and neurotoxicity in their victims[43]
Botanical name: *Clausena anisata* Hook. f. Family: *Rutaceae* Vernacular name: "Mkoda kwa degedege" A deciduous shrub or small tree, 4(-10) m tall; bark smooth, grey-green changing to brownish and becoming mottled; young twigs short-hairy. Leaves alternate, imparipinnate, up to 30 cm long; stipules absent; leaflets 11-37, alternate or almost opposite, ovate to narrowly elliptical	Leaves Pounded and soaked into the water drunk to accelerate child delivery, treat infants and children with unknown fevers assumed to be degedge (Infant/child convulsion) leading to poor child growth Roots Extract in hot water is drunk to treat headache, irregular menses to women, sexual	Ethno medicine: commonly used in traditional medicine throughout tropical Africa aromatic leaves or roots is widely drunk to treat gastro-intestinal disorders, fever, pneumonia, headache, sore throat and sinusitis and as an anthelmintic against various kinds of worms[44] Leaves Are antiseptic and analgesic; treat wounds, aching teeth and other mouth infections, otitis, itch, sores, abscesses, burns, haemorrhoids, rheumatism and other body pains., maggot-infested wounds in domestic animals,. snake-bite antidote, venereal diseases and as an aphrodisiac, strengthen infants and prevent rachitis, treat hypotension and a sore throat. Leaves are poultice on boils and spots[44] Root: Taken as a tonic by pregnant women, facilitate child birth and cleanse the uterus;. control convulsions; treat indigestion, whooping cough, malaria, syphilis and kidney, given to women after childbirth to promote milk production; treat irregular menses, threatening abortion, skin diseases and epilepsy[44] Laboratory investigation: Leaf essential oil exhibited Significant antibacterial activity against *Salmonella typhimurium*, *Pseudomonas aeruginosa*, *Alcaligenes faecalis*, *Bacillus subtilis*, *Flavobacterium suaveolens*, *Leuconostoc cremoris* and *Serratia marcescens*. Clausenol showed significant activity against a range of Gram-positive and Gram-negative bacteria and fungi. Significant antifungal activity against *Alternaria alternata*, *Aspergillus parasiticus*, *Geotrichum candidum*, *Phytophthora palmivora* and *Penicillium citrinum*; also possesses moderate antioxidant activity *in vitro*[44] Leaves Extracts showed strong antifungal activity against the fungi causing oral candidiasis and fungal infections of the skin, *Candida albicans*, *Candida glabrata*, *Candida tropicalis*, *Candida parapsilosis*, *Candida krusei* and *Cryptococcus neoformans*[44] Root extract Showed molluscicidal activity in a bioassay with *Bulinus globosus*, *schistosomiasis*, *coumarins heliettin* and *imperatorin* were more toxic to the test snail than other coumarins used in the bioassay Showed moderate hypoglycaemic activity in laboratory rats[44]
Botanical name: *Spermacoce dibrachiata* Oliver Family: *Rubiaceae* Vernacular name: "Mkoda kwa ngerekha" Growing in open grasslands	Leaves: For treating "Mtoto wa jicho" (cataract) The leaves are cruised and the juice is dropped in the eyes	Very few studies have been done on this plant Annie[45] has reported to be one of the useful plants for managing Menstrual disorder
Botanical name: *Vangueria infausta* Burch Family: *Rubiaceae* Vernacular name: Msada Shrub 2-3 m tall or small tree growing in open woodland; flowers white, ripe fruits brown, roundish	Roots Extract in hot water drunk for treating vomiting, gynaecological and sexual transmitted diseases, AIDS and gonorrhoea, coughing, stomach disorders and diarrhoea	Ethno medicine: The fruits Eaten by both people and wild animals Different parts of this plant Used traditionally for treatment of wounds, menstrual and uterine problems, chest ailments like pneumonia, as purgatives, toothache treats ring worms and genital swellings among others[46-48] Laboratory investigation Recent pharmacological reports have shown that extracts from leaves and roots of this plant exhibited significant antiplasmodial activity[49]

Table 1: Continue

Description on medicinal plants	Field work results on medicinal use	Medicinal use of the herbal plants in literature review
Botanical Name: *Launaea cornuta* (Hochst. ex Oliv. and Hiern) C. Jeffrey Family name: *Asteraceae* Vernacular name: Mchunga Herb ca. 0.5-1 m tall; flowers yellow; weed in farmland	Whole plant Pounded and soaked into water or boiled. The extract drunk for treating worms, impotence and stomach problems, sexual transmitted diseases and AIDS., children are washed with the decoction for treating measles Leaves Used to feed rabbits and chicken	Ethno medicine Decoction of the whole plant of *L. cornuta*, used to treat cancer of breast and prostate glands, epilepsy, fever, cancer of breast and prostate glands, young shoots of *L. Cornuta* and *Mangifera indica* Dry young shoots of *L. Cornuta* and *Mangifera indica* are used to treat diabetes[50, 51]
Botanical Name: *Dichrocephala integrifolia* Family name: Compositae (l. f.) Kuntze Vernacular name: "Mkoda kwa fivamba" Herb growing as a weed in farmland and also in woodland	Leaves Are pounded and the juice is dropped/smeared on the parts affected by sores, herpes zoster and fire burns and treating wounds	Ethno information Leaves Used to treat indigestion, dyspepsia, indigestion as an antiphlogistic and an antiemetic, to treat gastro-intestinal parasite[52] Labaratory Ethanolic extracts of *D. integrifolia* contained compounds with ovicidal and larvicidal properties[52]
Botanical name: *Thunbergia* Family: Acanthaceae Vernacular name: "Mkoda kwa lileme" Herb growing in open woodland and on farmland	Leaves Used against stomach ache and abdominal disorders	Leaves Are crushed and added to water and given to children with wounds in the mouth and tongue And buds may also be pounded and mixed with ghee, then used for treating backache and joint pains[53]

The findings have shown that the prescribers of the common herbal plants were either self prescribed or by the friend or relative or neighbour who showed the herbal plant(s). For the cases of reproductive health problems to women and infants health problems any of the following mother, mother-in-law, aunt, senior sister and sister in law prescribed the treatment or consulted for treatment. Whereas for men mostly were the father, grandfather and uncles. The routes of administration were mainly oral and topical application incisions where the pain was and then smeared with grounded herbal remedy and sometimes bathing. With regard to availability, the findings showed some of the herbal remedies were reported to be found in far places of about two to three hours herbal plants, there were no common mentioned herbal plants planted near the houses except to healer's places where two or more plants were seen.

The sources of information of the common herbal plants used were from parents, relatives and friends when encountered with a health problem. One of the respondents who had a child that had repeated fevers and the growth was stunted reported.

"A friend told to use "mkoda kwa degedege" and I should crush the leaves and soak into water for half an hour and I administer to the child with a dose of food spoonful in the morning, afternoon and in the evening. I used "mkoda kwa degedege". After one week the fevers stopped and child recovered from the illness".

The other respondent who was a female said "We learn the useful herbal plants from friends, elder people and relatives when we have health problems. At present I know several herbal plants for "nyavana" (infant periodic fevers) illnesses which are difficult to be cured in health facilities".

The researcher was interested to know if there was any ritual involved in the used common herbal plants. One of the healers who participated in this study said "common herbal remedies do not have rituals to be performed. These are common plants to all people. However some the common herbal plants have rituals when used to treat health problems believed to be caused by transgressing cultural norms or associated with witchcraft. These rituals are performed with special healers for such kind of health problems".

During the interview another healers said "Mkoba wa dawa" (bag of medicine) cannot be given to anybody but few selected by "mzimu" (ancestors) in the respective clan. This may be a female or male but most preferable male.

The other healer, on the other hand, was concern with new emerging diseases like HIV/AIDS, cancer and diabetics. The healer argued that these were new diseases to their community. The approaches used to manage these new health problems were to associate symptoms of known diseases and the new diseases For example sexual transmitted diseases like syphilis and gonorrhoea had some symptoms similar with that of HIV/AIDS like abnormal discharge to women, sores and open ulcers at the anus, inside the mouth, loss of hair, etc.. He said some of the remedies used to treat syphilis and gonorrhoea were also tried to HIV/AIDS patients and showed to alleviate the suffering from HIV/AIDS patients but he did not mentioned the herbal plants used. Among the 13 herbal plants listed, no one among the respondents reported any contra indication for any person who used it.

In general, the respondents showed that the herbal plants were very useful to manage common health

problems because the availability drugs and other medical supplies in health facilities were for the first week or second week of the month. Whenever they went to health facility for health services they were asked to go to buy the prescribed drugs to medical store. The drugs to medical stores were expensive and most people in the ward could afford especially old people who had no children to assist them to buy such drugs. Some of the medical stores were owned by health providers. One of old respondents stressed.

"The only hope is from the herbal plants that we inherited from our forefathers and grandparents and others that we discover now. But also these herbal plants are now diminishing with increasing number of people who are cultivating even the marginal land and sources of water where some herbal plants were being found".

Cross checking the information with some healthcare providers in the ward, they agreed about the availability of the drugs and other medical supplies were at most two weeks in a month and the only option to request relative of the patients to buy the prescribed drugs to medical stores.

Comparison of field information of common herbal plants with same plants found in literatures reviewed: Herbal plants are found and used everywhere for healthcare in developing countries and also in developed countries[1, 27]. The study compared notes of the herbal plants reported medicinal uses in this study with other studies of the same herbal plants published in journals, books and websites in different countries in the world. The general observation from the present study findings and those from literature reviewed showed most herbal plants treat >1 health conditions, in other words have multiple uses (Table 1). Besides the general observation findings has revealed some of the herbal plants had similar medicinal uses with those found in literature reviewed in different developing countries. For example Psidium guajava in this study it has been found to treat diarrhoea. Similar health problem was also reported in Philippine. Not only this herbal plant but also other herbal plants as well (Table 1). How was this knowledge in the past with limited means of communication and transport shared from one country to another? Some herbal plants were found to be used in the whole Africa. For example "mkoda kwa degedge" was commonly used in traditional medicine throughout tropical Africa with different uses. In literature reviewed mkoda kwa ngerakha has shown, a decoction of the aromatic leaves or roots is widely drunk to treat gastro-intestinal disorders, fever, pneumonia, headache, sore throat and sinusitis and as an anthelmintic against various kinds of worms[27]. Further "mkoda kwa degedege" in Kenya, a root decoction was given to women after childbirth to promote milk production and is also drunk to treat irregular menses, threatening abortion, skin diseases and epilepsy[27]. In the Seychelles on the other hand a leaf decoction is drunk to treat hypotension and a sore throat. Similarities and differences of the herbal plants collected from this study and those reviewed are shown in Table 1.

DISCUSSION

Data of common used herbal plants for various health problems from fieldwork compared with the same herbal plants from literature review on their uses has been presented and analysed. The sampled respondents were collaborative and had a wide knowledge of the common used herbal plants for various health problems at the ward. Based on collaborative nature of the respondents in this study, vernacular names of common used herbal plants and health conditions treated at Mlangali ward were identified. At the herbarium of ITM the botanist identified scientific names of collected specimen samples of common used herbal plants. Some of the vernacular names where the names of ill health conditions, e.g, "mkoda kwa ngerakha" for cataracts (Table 1). This creates problems to identify which plant if the specimen of the plant is not shown, since there might be many plants treating the same kind of ill health conditions and taking the same name as "mkoda kwa ngerakha". The role of the botanist is crucial at such situation to differentiate herbal plants by using of scientific names. The identified common used herbal plants at Mlangali Ward treated/alleviated common health problems occurring at the ward like diarrhoea, dysentery, cough, headache, women health problems, stomach ache, flue and infants health problems. Even though these ill health conditions could be managed by the health facilities, there was no drugs and other medical supplies, a common cry to many rural areas in developing countries[14, 19, 54]. Thus, common known herbal plants and THPs become the only options for people living in rural areas[55, 56]. In order to survive in the absence of drugs and other medical supplies from these health problems, people creatively used the knowledge of herbal remedies inherited from time immemorial to manage health problems occurring at the community. This creativity of humankind on managing health problems by using herbal plants found within his environment is likely to be appearing in other rural wards/villages worldwide where medical drugs and other supplies are inadequate or not available. The key question is how safe are these unknown herbal remedies from scientists.

Based from the long time of use of the common used herbal remedies it is very likely led to establishment of common useful herbal plants for alleviating/treating common health problems occurring in the community[8, 9]. The knowledge of the common herbal plants was then passed from one generation to another till present

times[1, 55]. Further findings show creativity goes hand in hand with sharing knowledge of common herbal plants with neighbours, relatives and friends for managing health problems just on their onset. In this way the knowledge of useful common herbal plants is disseminated, stored and passed from one generation to another as cultural product. Besides the above, the findings also seem to suggest not all knowledge of how to use herbal plants of the community is made public. There is some special knowledge of how to use the herbal plants is entrusted to few people and mostly THPs or special clan in the community for fear of being misused/abused[57]. As shown in these study findings, some treatment using the same plants were empowered with special rituals that may involve long litany of prayers[16, 17]. The present findings underscore other researchers[58-60] that the custodians of special knowledge of TRM are THPs. All in all the most important to be underscored in study is community responsibility for maintaining health of its members.

The useful knowledge need to be documented where others users can refer to. In this study there was no place in the ward where common used herbal plants were documented. The present observation of not documenting useful common herbal plants in the community is likely to be found in other communities by taking for granted that they are known by everybody. But people with knowledge of herbal plants and how to use them with different ailments are aging and dying[15]. It has to be stressed knowledge of useful medicinal plants is with the old people and it is very likely to be lost if not well documented at present from the few existing indigenous experts on medicinal plants and the practice of traditional medicine[13, 15, 18, 55, 57]. Children who are supposed to inherit the knowledge and practice of how to use the common herbal plants are at boarding school and colleges and some may not be interested on traditional medicine[15]. For continual use of the common herbal plants for the common health problems in the community in future and for scientific studies need to be documented. The documentation should show the name of the plant where found, parts used as remedy and how to prepare, dosage, how administer to the clients and show if there are some contra indication for safe use. In this way, the knowledge and the cultural component woven in the common used herbal plants is stored and transmitted to the next generation.

Further, the findings has shown most of the herbal remedies used were collected within a day or the very day when needed and hence being flesh with leaves being green. Seldom dried plants were used for treating common health problems. The process in phytochemestry laboratory that involves drying, using the solvents and purification of sample studied, it is likely some of the compounds that might be active to the named disease/illness can be lost. Ethno information is necessary to be collected while collecting the sample specimen i.e. when to collect, processing and prescription. The hit and run approaches which most researchers do[61,62] for benefit of time located will end up losing essential information of herbal plants that might be active and be denied not to be active.

Comparing the analysis of identified scientific names of herbal plants and their uses in this study with same herbal plants from other studies show some of the herbal plants are being used worldwide for managing same health problems. For example illness/disease treated by *Clausena anisata* Hook. f, *Stegonotaenia araliacea* Hochst. (*Peucedanum araliaceum* Benth. and Hook. f. ex Vatke), *Vernonia colorata* (Willd.) Drake, *Psidium guajava* (mprera) *Dissotis rotundifolia Rumex hymenosepalus* in this study; similar health conditioned were reported in other studies[27-29, 33]. Again, some herbal plants in this study and those reviewed have multiple uses .in managing health problems worldwide[27, 31]. For example *Clausena anisata*, *Dissotis rotundifolia*, *Psidium guajava* ethno medicine information show that these plants are used everywhere in the world with multiple uses[27, 29, 44]. It is very likely when these herbal remedies are used for targeted health problem, might be as well treating other ailments whose symptoms have not manifested- thus the holistic aspect of the herbal plants. Some of these herbal plants noted in this study have already been screened for active ingredients (Table 1).

The common useful plants in the study are likely to be facing threat of extinction as an impact of population growth who cultivates even the marginal for livelihood. As shown in the present findings some useful plants were obtained at two hours or more walking distance (about 7-9 km from home place). Other threats are periodic bush fires and unsustainable harvesting of the herbal plants. Similar findings of threats of the medicinal plants have been shown by other studies[15, 63]. However, the magnitude threat of the present study and those reviewed is not established.

CONCLUSION

Currently, there is no adequate human resource in the health facilities in Tanzania and other developing countries. In addition, there is limited drugs and medical supplies for most available healthcare of the people in rural areas in developing countries. Common used herbal plants in rural wards/villages and THPs become the only options especially in rural areas. In developing countries, like Tanzania, there is a need to see the role of herbal plants in the lens of primary healthcare with the aim of better health wellbeing in in financial resource poor developing countries and hence accelerating the speed to meet 4-6th Health Millennium Development goals before 2015[64]. It is being argued thus, an inventory of these

common used herbal plants should be done at each village by identifying the local names where found, time to collect, processing, dosage and how to administer to clients. People at the community level should be trained on sustainable conservation, establishing botanical gardens around the houses for immediate use. Above all the most reported common herbal plants in most wards/villages at regional level should be subjected to screening for safety and efficacy. Herbal plants are promising areas for discovery of drugs new drugs for HIV/AIDS, cancer, TB, diabetes etc. On the bases of the intellectual property, for the villages that would come with herbal remedies that lead will to discovery of new drugs should sign a memorandum of understanding which states what percentage will get from the sales of drugs as partners in new drug discovery.

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REFERENCES

01. WHO., 2007. WHO Guidelines for Assessing Quality of Herbal Medicines with Reference to Contaminants and Residues. World Health Organization, Geneva, ISBN-10: 9241594446, Pages: 105.
02. Addis, G., D. Abebe and K. Urga, 2001. A survey of traditional medicinal plants in Shirka district, Arsi zone, Ethiopia. Ethiop. Pharmaceut. J., 19: 30-47.
03. Iwu, M.M., A.R. Duncan and C.O. Okunji, 1999. New Antimicrobials of Plant Origin. In: Perspectives on New Crops and New Uses, Janick, J. (Ed.). ASHS Press, Alexandria, VA., USA., ISBN-13: 9780961502706, pp: 457-462.
04. Mahonge, C.P.I.N., J.V. Mtangi and A.C. Matte, 2006. Utilization of medicinal plants by Walguru people in east Uluguru mountains, Tanzania. Afr. J. Trad. CAM, 3: 121-134.
05. Kitula, R.A., 2007. Use of medicinal plants for human health in Udzungwa Mountains Forests: A case study of New Dabaga Ulongambi Forest Reserve, Tanzania. J. Ethnobiol. Ethnomed., Vol. 3. 10.1186/1746-4269-3-7
06. WHO, 2008. World health report 2008 primary healthcare (now than ever). World Health Organization, Geneva.
07. Kleinman, A., 1980. Patients and Healers in the Context of Culture: An Exploration of the Borderland Between Anthropology, Medicine and Psychiatry. University of California Press, Berkeley, ISBN:9780520045118, Pages: 427.
08. Van der Geest, S., 1997. Is there a role for traditional medicine in Basic health services in Africa? A plea for community perspective. Trop. Med. Int. Health, 2: 903-911.
09. Florian, Z., 1963. Cultural Sciences Their Origin and Development. University of Illinois Press, Urbana.
10. Kayombo, E.J., F.C. Uiso, Z.H. Mbwambo, R.L. Mahunnah, M.J. Moshi and Y.H. Mgonda, 2007. Experience in initiating collaboration of traditional heallers in managing HIV/AIDS in Tanzania. J. Ethnobiol. Ethnomed., Vol. 3. 10.1186/1746-4269-3-6
11. Kayombo, E.J., 1996. Tambiko a Healing Therapy in Tanzania. In: Psychotherapy in Africa, First Investigations, Madu, S.N., P.K. Baguma and A. Pritz (Eds.). World Council for Psychotherapy, Kenya.
12. Kayombo, E.J., 2013. Impact of training traditional birth attendants on maternal mortality and morbidity in Sub-Saharan African countries. Tanzania J. Health Res., Vol. 15. (In Press).
13. Langwick, S.A., 2011. Bodies, Politics and African Healing: The Matter of Maladies in Tanzania. Indian University Press, USA., SBN-13: 978-0253222459, PAges: 230.
14. Kayombo, E.J., F.C. Uiso and R.L.A. Mahunnah, 2012. Experience on healthcare utilization in seven administrative regions of Tanzania. J. Ethnobiol. Ethnomed., Vol. 8. 10.1186/1746-4269-8-5
15. Mahunnah Rogasian, LA., F.C. Uiso and J.K. Edmund, 2012. Documentary of Traditional Medicine in Tanzania: A Traditional Medicine Resource Book. Dar-es-Salaam University Press, Tanzania.
16. Kayombo, E.J., 1999a. Traditional healers and treatment of HIV/AIDS patients in Tanzania. A case of Njombe rural areas district, Iringa region. Ph.D. Thesis, University of Wien.
17. Kayombo, E.J., 1999b. *Kupinga Tego* in Southern Highlands of Tanzania: A Case of One African Traditional Methods of Healing. In: African Conference on Psychotherapy, in Quest for Psychotherapy for Modern Africa, 1st African Conference on Psychotherapy, in Quest for Psychotherapy for Modern Africa, Madu, S.N. and P.K.A. Pritz (Eds.). UNIN Press, Pietersburg, pp: 20-34.
18. Cosminsky, S., 1983. Traditional Midwifery and Contraception. In: Traditional Medicine and Health Care Coverage, Bannerman, R.H., J. Burton and C. Wen-Chieh (Eds.). WHO, Geneva.

19. Chudi, I.P., 2010. Healthcare problems in developing countries. Med. Practice Rev., 1: 9-11.
20. The United Republic of Tanzania, 2012. National population census 2010. Dar-es-Salaam, United Republic Tanzania.
21. UNAIDS, 2000. Collaboration with traditional healers in HIV/AIDS Prevention and care in Sub Saharan Africa: Best practice collection. UNAIDS, Geneva, Switzerland.
22. WHO, 2003. Annex 3 supplementary guidelines on good manufacturing practices for the manufacture of herbal medicines. Technical Report Series, No. 937. World Health Orgnization, Geneva.
23. Glaser, B.G. and A.L. Strauss, 1967. The Discovery of Grounded Theory: Strategies for Qualitative Research. Transaction Publishers, Chicago, IL., USA., ISBN-13: 9780202302607, Pages: 271.
24. Munisi, W., R. Said, D.E. Mushi, J.M. Bwire, D.S. Sendalo and J.I. Mkonyi, 2004. The role of savings and credits cooperative societies in sustainable dairy goats production: Expereince from Dodoma in central Tanzania. Proceedings of the 31st Scientific Conference of Tanzania Socity of Animal Production, Volume 31, October 5-7, 2004, Tanzania, pp: 27-31.
25. Moerman, D.E., 1998. Native *American Ethnobotany*. Timber Press, Portland.
26. Munz, A., 1959. *California* Flora. University of California Press, California, USA.
27. Abere, T.A., P.E. Okoto and F.O. Agoreyo, 2010. Antidiarrhoea and toxicological evaluation of the leaf extract of dissotis rotundifolia Triana (*Melastomataceae*). BMC Complementary Altern. Med., Vol. 10. 10.1186/1472-6882-10-71
28. Gill, L.S., 1992. Ethnomedicinal Uses of Plants in Nigeria. 1st Edn., University of Benin Press Benin-City, Nigeria, Pages: 276.
29. Noumi, E. and A. Yomi, 2001. Medicinal plants used for intestinal diseases in Mbalmayo region, Central Province, Cameroon. Fitoterapia, 72: 246-254.
30. Watt, J.M. and M.G. Breyer-Brandwijk, 1962. The Medicinal and Poisonous Plants of Southern and Eastern Africa. 2nd Edn., Vol. 137, E & S Livingstone Ltd., Edinburgh, London pp: 744.
31. Kokwaro, J.O., 1993. Medicinal Plants of East Africa. 2nd Edn., Kenya Literature Bureau, Nairobi, ISBN-13: 9789966441904, Pages: 401.
32. WebMD, 2009. Find a vitamin or supplement *Eucalyptus*.http://www.webmd.com/vitamins-supplements/ingredientmono-700-EUCALYPTUS.aspx?activeIngredientId=700&active IngredientName=EUCALYPTUS.
33. Gutierrez, R.M.P., S. Mitchell and R.V. Solis, 2008. *Psidium guajava*: A review of its traditional uses, phytochemistry and pharmacology. J. Ethnopharmacol., 117: 1-27.
34. Batick, M.J., 1984. Ethnobotany of Palms in the Neotropics. In: Advances in Economic Botany: Ethnobotany in the Neotropics, Prance, G.T. and J.A. Kallunki, (Eds.). New York Botanical Garden, New York, USA., pp: 9-23.
35. Khan, M.L.H. and J. Ahmad, 1985. A pharmacognostic study of *Psidium guajava* L. Int. J. Crude Drug Res., 23: 95-103.
36. Ohigashi, H., M.A. Huffman, D. Izutsu, K. Koshimizu and M. Kawanaka *et al*., 1994. Toward the chemical ecology of medicinal plant use in chimpanzees: The case of *Vernonia amygdalina* Del. A plant used by wild chimpanzes possibly for parasiterelated diseases. J. Chem. Ecol., 20: 541-553.
37. Tra Bi, F.H., MW Kone and N.F. Kouame, 2008. Antifungal activity of *Erigeron floribundus* Asteraceae) from Cote d'Ivoire. West Africa Trop. J. Pharm. Res., 7: 975-979.
38. Sy, G.Y., A. Cisse, R.B. Nongonierma, M. Sarr, N.A. Mbodj and B. Faye, 2005. Hypoglycaemic and antidiabetic activity of acetonic extract of *Vernonia colorata* leaves in normoglycaemic and alloxan-induced diabetic rats. J. Ethnopharmacol., 98: 171-175.
39. Orwa, C., A. Mutua, R. Kindt, R. Jamnadass and A. Simons, 2009. Agroforestree database: A tree reference and selection guide, version 4.0. World Agroforestry Centre, Kenya. http://www.worldagro-forestry.org/output/agroforestree-database.
40. Maharaj, V. and K.Z.N. Glen, 2008. Parinari curatellifolia$^{\text{Planch. ex Benth}}$. SA National Biodiversity Institute, September 2008. http://www.plantzafrica.com/plantnop/parinaricurat.htm.
41. Halilu, M.E., I.K. Akpulu, A. Agunu, A. Ahmed and E.M. Abdurahman, 2008. Phytochemical and antibacterial evaluation of *Parinari curatetellifolia* planch Ex Benth (Chrysobalanaceae). J. Applied Sci., 16: 281-285.
42. Ogunbolude Y., M.A. Ajayi, T.M. Ajagbawa, A.P. Igbakin, J.B.T. Rocha and I.J. Kade, 2009. Ethanolic extracts of seeds of Parinari curatellifolia exhibit potent antioxidant properties: A possible mechanism of its antidiabetic action. J. Pharmacog. Phytoth., 1: 67-75.
43. Omale, S., A. Auta, S.B. Banwat, K.I. Amagon and Y.P. Thomas, 2011. Effects of the ethanolic extract of *Parinari curatellifolia* on cat blood pressure and rabbit jejunum preparations. Int. J. Pharm. Frontier Res., 1: 39-44.
44. Tchinda, A.T., 2011. Clausena Anisata (Willd.) Hook.f. ex Benth. In: Medicinal plants/Plantes Medicinales 2, Schmelzer, G.H. and A. Gurib-Fakim (Eds.). PROTA, Wageningen, Netherlands.

45. Annie, S., 2011. The girl-child and menstrual management in Zimbabwe: Part II. March 2011, Harare. http://www.wsscc.org/sites/default/files/publications/annieshangwa_mhm_report2_zimbabwe_2011.pdf.
46. Behr, K., 2004. Vangueria infausta burch. subsp. infausta. Pretoria National Botanical Garden, March 2004. http://www.plantzafrica.com/planttuv/vanguarinfaust.htm.
47. Chhabra, S.C., F.C. Uiso and E.N. Mshiu, 1984. Phytochemical screening of tanzanian medicinal plants. I. J. Ethnopharmacol., 11: 157-179.
48. Chhabra, S.C., R.L.A. Mahunnah and E.N. Mshiu, 1991. Plants used in traditional medicine in Eastern Tanzania. V. Angiosperms (Passifloraceae to Sapindaceae). J. Ethnopharmacol., 33: 143-157.
49. Mbukwa, E., M. Chacha and R.R.T. Majinda, 2007. Phytochemical constituents of *Vangueria infausta*: Their radical scavenging and antimicrobial activities. ARKIVOC, 9: 104-112.
50. Hedberg, I., O. Hedberg, P.J. Madati, K.E. Mshigeni, E.N. Mshiu and G. Sumuelson, 1982. Inventory of plants used in traditional medicine in Tanzania. 1. Plants of the families Acanthaceae-Cucurbitaceae. J. Enthnopharmacol., 6: 29-60.
51. Kareru, P.G., G.M. Kenji, A.N. Gachanja, J.M. Keriko and G. Mungai, 2007. Traditional medicine among the Embu and Mbeere peoples of Kenya Afri. J. Trad. Complement. Alternat. Med., 4: 75-86.
52. Wabo, P.J., V.K. Payne, M.T. Gertrude, M.C. Komtangi and Y. Jeannette *et al*., 2013. *In vitro* anthelminthic efficacy of *Dichrocephala integrifolia* (*Asteraceae*) extracts on the gastro-intestinal nematode parasite of mice: *Heligmosomoides bakeri* (Nematoda, Heligmosomatidae). Asian Pac. J. Trop. Biomed., 3: 100-104.
53. UNEP, 2008. Traditional medical practices and medicinal plants in Kenya and East Africa. United Nations Environment Programme.
54. Rahman, S.U. and D.K. Smith, 1999. Deployment of rural health facilities in a developing countries. J. Operat. Res. Soc., 50: 592-902.
55. Busia, K. and O.M.J. Kasilo, 2010. Collaboration between traditional health practitioners and conventional health practitioners: Some country experiences. West African Health Organization.
56. Chokevivat, V. and A. Chuthaputti, 2005. The role of Thai traditional medicine in health promotion. 6GCH P Bangkok Thailand, August 7-11, 2005, Bangkok Thailand.
57. Kayombo, E.J., 2013. Indigenous knowledge and HIV/AIDS prevention and management in local communities in Africa South of the Sahara. Pharm. Analytica Acta, Vol. 4.
58. Bhasin, V., 2008. Gaddis' folk medicine: A source of healing. Ethno-Med., 2: 1-27.
59. Yineger, H. and D. Yewhalaw, 2007. Traditional medicinal plant knowledge and use by local healers in Sekoru District, Jimma Zone, Southwestern Ethiopia. J. Ethnobiol. Ethnomed., Vol. 3. 10.1186/1746-4269-3-24
60. Iwu, M.M., 2001. Forward. In: Biodiversity and Traditional Knowledge: Equitable Partnerships in Practice, Laird, S.A. (Ed.). Earthscan Publications Ltd., London.
61. Patton, M.Q., 2002. Qualitative Research and Evaluation Methods. 3rd Edn., Sage Publication, California, ISBN: 0-7619-1971-6, Pages: 598.
62. Mark, W., 1999. For many U.S. scientists, the days of hit-and-run research are over. National Wildlife Federation, USA.
63. Agyei, Y., 2001. Deforestation in Sub-Saharan Africa. African Technology Forum, Africa.
64. UN, 2006. The millenium development goals: The way forward. United Nations.