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POTENTIALS, DEMAND of MEDICINAL PLANTS; A REVIEW of POLY HERBAL FORMULATIONS for the TREATMENT of SKIN INFECTIONS.

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ABSTRACT

Many skin diseases frequently occur with several health difficulties that cuts across all ages, from the babies to the aged, and in several ways causes harm. To treat these skin diseases, wild plants and their parts are commonly used. In developing countries, natural treatment is usually cheap and claimed to be harmless, hence its demand. The study aimed at traditional poly herbal formulations, as a treatment for skin infections and other skin related diseases, its potentials and demand. The review of the phytochemical screening for their active ingredients on the plant specimens such as Daniella oliveri, Bombax buonopozense and Olax subcorpioidea showed the presence of phytochemicals such as Tannins, Steroids and Flavanoids revealing their ability to treat skin infections. This study confirms that the potentials of poly-herbal medicines are great in treating a number of skin infections and rural, urban dwellers still makes use of traditional healing methods.

KEYWORDS: Ethno medicine, Plant, Skin, Poly Herbal Formula, Disease, Demand.

1. INTRODUCTION

The global market for herbal medicines in 2004 comprising of herbal products and raw materials is estimated to be US $65 billion based on a [1] estimate was US $45 billion with a yearly growth rate of 5 to15 percent. This global market demand of herbal medicines is now seen as income generators for individuals, business owners as well country, which competes favorably with coffee, oil palm, cocoa, and cotton and their value now visible.

The skin being the largest organ of the body every now and then becomes infected even though it protects the body from infection. It becomes infected because it's the body part with immediate contact with the environment especially when the environment is a harsh one. According to [2] skin infections are the disorders which are evident or obvious in the coverings of the skin. Evident and obvious in the sense that it is readily seen being the outer covering of the body. They are irritations of the skin caused by combination of vectors with allergic reactions to substances/organisms that irritates the skin that leads to itching and (or) discharge in such organisms.

Also, skin infections are outcome of a varied range of microbes which are organisms too minutes to be seen with the eye unless microscopes are used; of which symptoms for the numerous infections by these microbes may be different from minor infections to critical ones [2]. Minor infections are occasionally treated with home remedies or over-the-counter medications these normally do not require medical experts' intervention in treatment because they are lesser in degree, whereas critical infections may require intense and specialized medical care due to its severity and not home remedies. The skin conditions at municipal level may include: scabies, superficial mycoses, pyoderma, pediculosis, eczema or dermatitis, HIV- related skin diseases, pigmentary anomalies and acne [3]. Causes of common skin infection are bacteria, viruses, pathogens and fungi. Fungi are mostly found in hot environments which are majorly tropical in nature example of countries in the tropics is Nigeria; this is because of high temperature and high moisture conditions in tropical environment which enriches the growth of these fungi [4].

The causes of skin disorders are common in developing countries, where conditions of living (in relation to the health, nutrition physical activity amongst others) are poor [5].In situations where there are poor feeding habit and health conditions, not only the skin is affected other parts of the body suffers as well. These causes of skin disease are common among the school children in urban and rural settings, where overcrowding, mal-nutrition and humidity, heat, food, and medication allergies are prevalent [6]. This is inevitable especially amidst children where there are high levels of closeness due to crowding. [5] Also confirms that high humidity, heat and lack of sanitation are associated with an increased risk of fungal and bacterial skin infections. Lack of good sanitation is

a breeding ground for fungi and bacteria growth which leads to various ailments. A variety of microorganisms causes skin ailments such as boils, itching, rashes, ringworm, chicken pox, small pox, skin disorders, leprosy, wound, dermatitis, eczema, scabies, skin allergy swelling and psoriasis [7].

Over the years, humans have searched for ways to treat these skin ailments; according to [8] values are commonly placed on herbs for virtues such as food as well as medicine. In a bid for treatment of ailments, our forefathers through a lengthy process of experimental processes and at times resulting in inaccuracy (trial and error) were able to select hundreds of wild plants in their different localities for specific uses. These could be due to nearness to these plants i.e its availability. These experimental processes spans through years and this information on economic front of plant use was passed down from a generation to another especially through word of mouth and without any published records [7]. For the treatment of diseases and disorders like dysentery, skin diseases, hypertension, headache, boils and blisters, ophthalmic diseases, fever, ethno medicinal plants are used etc[9].

In the bid to find solution to treatment of ailments and disease a number of herbs are combined to give the desired result. The use of more than one herb in a medicinal preparation is known as Poly herbal formulation (PHF). This specific concept is found in Ayurvedic and other traditional medicinal systems 1300 A.D, as pointed out by [10], where numerous herbs in specific ratio combinations are used to treat ailments. The World Health Organization (WHO) estimated that about 80% of the population living in the developing countries depends greatly on traditional medicine for their primary health needs. More than half of the world's population still depends on herbal mixtures for treatment this is evident in[11] which submitted in both developing and developed countries that there is a prevalent growth in the production of herbal mixtures due to their natural source and limited side effects. They are produced from medicinal plants and minerals which are used for the treatment of diverse ailments including skin infections.

Hence the need for this study, to examine traditional polyherbal formulations, its potentials and demand in treating skin infections and other skin diseases.

2. LITERATURE REVIEW

2.1 The Skin and Its Functions

Human skin is the largest organ in the body of humans which is the outer covering of the body and constitutes the first line of resistance against infections [2]. Before any infection can come close to the body, the skin is the first to come in contact with which makes it a very important component of the body. The Skin is divided into three main layers the epidermis, dermis and hypodermis which are its specialized structures and cells. The epidermis, dermis and hypodermis provide a distinct role in the general function of the skin [2]. These roles cannot be overemphasized. Epidermis is the outmost layer of the skin; it varies in thickness across different areas of the body. This is shown in its thinnest on the eyelids (0.05mm) and thickest on the palms and soles (1.5mm). The dermis differs in thickness also depending on the location on the skin for example the eyelid and soles. It is 0.3mm and 3.0mm on the eyelid and the back of the body respectively.

Attached to an underlying hypodermis or subcutaneous connective tissue is the dermis. The subcutaneous tissue houses larger blood vessels and nerves which is a layer of fat and connective tissue. This layer is vital for the regulation of the skin and body temperature of the skin. Throughout the body and across individual, the size of this layer varies. Follicles of the air, sweat glands, and sebaceous glands are the main skin appendages. The underlying muscles in the body, bones, ligaments and internal organs like the kidney, liver are also protected by the skin. There are two general types of skin namely; hairy and glabrous skin. However, the skin can be dry, sensitive, pale, sagging or tired. People that are deficient in essential nutrients such as beta-carotene, the B complex vitamins and vitamins C and E often suffer from the drying of the skin.

Skin plays a major role in shielding the body against pathogens and excessive water loss because it comes in contact with the immediate environment human lives in. The skin function include insulation, temperature regulation, sensation, storage and essential vitamins production such as vitamin D through exposure to electromagnetic (UV) rays and the vitamin B folates fortification, gases absorption such as oxygen and medicines and resistance to moisture.

2.2 Symptoms and Risk Factors of skin infections

The symptoms of a skin infection differ depending on the form. This ranges from normal to serious skin infection. The normal symptoms include skin redness and rashes, itching, discomfort, and tenderness. The

following might also be some symptoms of a serious infection of the skin which are pus, burns, skin sloughing, necrotic-appearing skin, or faded and hurting skin.
The cause of a skin infection depends on the type of infection.

- Bacteria skin infection
- Bacteria skin infection typically occur when the skin has been affected earlier through one skin defects or the other, these skin defects are skin cuts, bruises, burns, insect bites, surgical wounds, injection of circulatory drugs or intravenous catheter insertion sites [12]. These infections frequently start as small, red bumps which increase in size gradually until it turns big. Some bacterial infections can be treated easily with topical antibiotics because they are mild and it will be gone, but for cellulitis, impetigo boils, and some other forms of bacteria skin infections oral antibiotics are required for their treatment.
- Parasites infestations
- These are mainly caused by parasites. According to [13] the phyla groups of organisms that causes stings and bites leading to infections in human beings are annelida, platyhelminthes, arthropoda, nemathelminthes, bryozoa, chordata, cnidaria, cyanobacteria, echinodermata, and protozoa. When these organism's bites or stings, infections occur in humans and it's parasitic in nature.
- Skin infection by virus
- [14] Reported the two major classes of viruses are responsible for virus-related cutaneous conditions; forms of DNA and RNA, which are mandatory intracellular parasites. Poxvirus, human papillomavirus, and herpes virus originates from the most common viruses: (MaryAnn and Valencia, 2017) [15]. These occur when the virus infiltrates the stratum corneum, causing the contamination of the inner layers of the skin. Examples of viral skin infections are Herpes simplex, shingles (herpes zoster) and warts. Some systemic viral infections that infect the skin are chicken pox and measles.
- Skin infection by Fungi
- The risk of fungal infection may be raised through body chemistry and day to day lifestyle of individuals. A poor lifestyle predisposes individuals to skin infection. In warm, wet locations, fungi thrive well and also feed, wearing sweaty or wet clothes is a risk factor for fungal skin infections, they gain ground the more in this moist environment. Fungi are a group of non-photosynthetic micro-organisms that exist as saprophytes in the soil and/or on dead organic matter, or as parasites of plants and animals, including humans, as noted by [16]. Their presence in the soil rotten plants, they are also present in air and water, and in the body or on human skin as part of the microbial flora. The predominant cause of fungal infections is dermatophytes.

2.3 Medicinal Plants as therapy for microbial skin diseases

Medicinal plants have been used around the world in the conventional treatment of skin diseases. Example of this is seen in the southern Nigeria where AcaIypha wilkesiana is used for children. AcaIypha wilkesiana is a popular widely used ornamental plant as a herbal remedy for the treatment of undefined skin infections in children in southern Nigeria [17]. The widespread use of Septilin, an Ayurvedic herbal formulation, as an immune modulator was also noted by [18] and has also been used in the treatment of different skin infections. It was noted in the treatment of burns, dermatophytes and infectious diseases or as an antiseptic and anti-inflammatory agent, Iranian Traditional Medicine (ITM) uses plants.

The use of plants and their phytoconstituents in the treatment of fungal infections such as oropharyngeal candidiasis, vulvovaginal candidiasis, spirotrichosis, chromoblastomycosis, among others, has also been documented. [19] Also stated that the leaves and twigs of Dodonaea vuscosa var. angustifolia, a South African plant, are used traditionally as gargle for oral candidiasis. Furthermore, Senna alata leaf juice and decoctions are employed in the treatment of ringworm and other skin diseases.

2.4 Developing countries and medicinal plants

Essential vaccines and drugs consumption pattern of pharmaceutical products between the developing and developed nations shows that great segment of the world's population in developing countries have no access to essential medicines this could be because the medicines are either unavailable, inadequately distributed or too expensive due to high importation cost. With 77 % of the world populations (then 5.3 billion) were living in developing countries with a consumption capacity of only 21 % of the world's total pharmaceuticals leading to higher demand and consumption of traditional herbs.

The same report specified that of the total population of the world, 1.5 billion in developing countries had little or no regular access to essential medicines. This was in contrast with the situation in developed countries where most, if not all of the 1.2 billion people living there were said to have steady and adequate access to essential medicines (WHO 2001) [1].

The trend of lack of access, inadequate distributions, high cost informs developing nations to exploit the numerous medicinal plants existing naturally in their countries which could serve as a solution to the precarious and irregular pharmaceutical supply. This could be traced to the global low financing and spending on pharmaceutical which makes the total number of people without access to essential medicine remains between 1.3 and 2.1 billion which is particularly concentrated in Africa and India, with less than 4 USD compared to that of developed countries of 400 USD (WHO 2001). [1]

2.5 Demands for Medicinal Plants

The demand for medicinal plants is on the high side in Africa especially in rural communities. [20] reported that the continent of Africa have an extensive history of plants use, it was observed that in some countries in Africa, up to 80% of the rural population rely on medicinal plants as a source of remedies. This could have stemmed up from lack of access to essential medicine which makes them settle for the ones readily available to them.

Medicinal plants usage ranges from treatment of diseases to herbal cosmetics. In herbal cosmetics they are formulated using different cosmetic ingredients to form the base in which one or more herbal ingredients are used to cure various skin ailments. Meanwhile most consumers of cosmetic products are women. This has led to increasing rapidly demand of herbal medicines due to their skin friendliness and lack of side effects. It is gaining acceptance as nowadays most women would go for natural products over chemicals for their personal care to improve their beauty. Because they believe it is purely made by herbs and shrubs and it is somewhat side-effects free and less dangerous for their skin.

Also as people continue to study more about the medicinal value plants, they increase the consumption of these medicinal plants which then result in better health. Apart from consumption, herbal medicines are also used for the treatment of certain diseases such as skin diseases. A study by [21] reported that Senna alata leaf juice decoction is used for the treatment of ringworm and other skin diseases.

However, WHO 2002 [22] reports that at least 80% of people in Africa still relies on medicinal plants for their health care. In Nigeria, and indeed the entire West African countries, herbal medicine has continued to gain much ground, this is because of its advantages in terms of low cost, being affordable, availability, acceptable by all, and seemingly low toxicity ([23],[24]). The low cost and affordability is as a result of it readily available around people, being used by one household with positive result also makes it somewhat acceptable to all as well.

In a survey conducted in Lagos metropolis Nigeria by [25], among herbal medicine users, the result shows that herbal medicine use was prevalent among the respondents. In Kenya, there exists very little evidence quantitatively or in literature on local medicine and the health practices or the demand for traditional medical practitioners on their role in providing health services for the rural poor. In Ghana, there is a long history of traditional medicine; herbal medicine is typically the leading approach to treat any ailment, most especially in the rural areas compared to urban area which suggests a high demand. (Ezekwesili-Ofili *et al* 2019) [26]

2.6 Challenges Associated with Poly Herbal Formulations

With many advantages of Ayurvedic PHFs to humanity some inevitable disadvantages still threaten them, affecting the effectiveness of its treatments. These could be because of the origins and development process of the PHFs, patients, Ayurvedic doctors, laws and regulations.

A lot of misconceptions are going on that Ayurvedic PHFs are always secure no matter the usage, which is untrue. According to [27], Charaka Samhita claimed that when Ayurvedic medicines are prepared or used inconsistently, they have adverse negative effects. [28] reported the simultaneous use of PHFs with allopathic drugs which is on the increase, also most patients fail to inform their medical practitioners on the affiliated treatments they are receiving which leads to combined use of drugs.

Also, due to inability to note the possible drug-herb interactions, which might have pharmacological or toxicological effects, and consequently results to a deterioration in the health of an individual [29]. Hence, the need to pay careful attention to drug-herb interactions.

Table 1: Ethno Botanical Information of Selected Medicinal Plants And Parts Used For Formulation

Botanical name	Family	Local name	Parts used
Daniella oliveri	Fabaceae	Emi	Bark
Bombax buonopozense	Malvaceae	Ponpola	Bark
Olax subcorpioidea	Oleaceae	Ifon	Bark
Khaya grandifolia	Meliaceae	Ogano	Bark
Piper guineensis	Piperaceae	Iyere	Bark
Anogesius leocarpa	Combretaceae	Ayin	Bark
Alstonia boonei	Apocynaceae	Ahun	Bark
Azadirachta indica	Meliaceae	Dongoyaro	Leaves and bark
Parkia biglobosa	Fabaceae	Iru	Seed

3. CONCLUSION

This review revealed that poly-herbal medicines are a great rich source of active ingredients and can be safer when used rightly and cost effective. It has abundant potentials in curing several types of infections on the skin also that a number of urban and rural dwellers still depend on traditional healing method for the treatment of skin infections and its associated diseases. It is also the oldest and the most extensively used medicine system in the world. Also, the knowledge of herbal medicine and traditional healing has been found among elders of the society.

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