Ethnopharmacognostic study of folk cosmeceuticals in Vhembe district, Limpopo Province, South Africa.

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ABSTRACT

Cosmeceuticals made from natural resources tend to have more advantages such as limited side effects, cheaper costs and biodegradability, compared to the synthetic ones. Even though ethnobotanical knowledge has the potential to generate new knowledge that may lead to the development of new products, this knowledge is disappearing quickly in recent times and that poses a threat to alternative sources of remedies for skin disorders. The aim of the study was to explore the ethnopharmacognosy of folk cosmeceuticals in Vhembe district. The study was conducted using the mixed method whereby semi-structured questionnaire was used to collect data from seventy-one (71) community members. The semi-structured questionnaire had both closed-ended and open-ended questions.Data collected were analysed using both qualitative and quantitative analytical methods. Qualitative data was thematically analysed while the quantitative ethnobotanical indices include use-value and relative citation frequency. In total, fifty-four (54) plants such as *Zea mays* L (0.16) (Mufhumbu ha mavhele),*Helinus integrifolius* (Lam.) Kuntze (0.18) (Mpupungwa), *Dicerocaryum zanguebarium* (Lour.) Merr (0.85) (Museto) and *Ricinus communis* L (0.28) (Mupfure) were recorded. These aforementioned plants were the most cited in the study area. The most common plant families were Leguminosae/Fabaceae (6), Ebenaceae (5), Poaceae (5) and Euphorbiaceae (4). In terms of plant life form, trees (41%) were the most common while leaves (31%) were the most popular plant parts. In total, 21 non-plant resources such as ashes, pig fat, ochre (Luvhundi soil), stone, python fat and soot were recorded asfolk cosmeceuticals among the selected communities in Vhembe district. The modes of preparation and indigenous practices in the usage of medicinal plants for cosmeceutical purposes were documented. Crushing (25%), grinding (14%) and juice (13%) were the most cited modes of preparation that were recorded, and performing of rituals and following taboos are some of the indigenous practices involved in folk cosmeceuticals to ensure their effectiveness. The remedies are mostly applied topically as paste, and some of the cosmeceutical conditions treated are rash, wound, ringworms, facial hygiene, shampoos and body creams. The customary rules, taboos and indigenous storages are some of the techniques used to ensure the availability of folk cosmeceuticals. The study concluded that, the number of natural resources documented is an indication that the Vhembe district is rich in ethnopharmacognostic knowledge regarding folk cosmeceuticals. Most of the

information was received from the elders, suggesting that young people do not have such knowledge. Hence, it is important to intensify effort(s) to document the ethnopharmacognosy knowledge regarding cosmeceuticals. To advance the findings from the current study, scientific validation of the claimed efficacy of indigenous cosmeceuticals is warranted/necessary.

Key words: Ethnopharmacology, Cosmeceuticals, Cosmetics, Indigenous Knowledge Systems, Communities, Natural resources.

DECLARATION

I, **Mamokete Venolia Setshego**, declare that the dissertation hereby submitted for the degree of Master in Indigenous Knowledge Systems at the North-West University is my own original and independent research work. The dissertation was done/written under the supervision of Dr W. Otang-Mbengand Dr A.O. Aremu. I have not previously submitted this dissertation or any part of it for any degree or examination to another Faculty or University. The research work reported in this dissertation does not contain any person's data, pictures, graphs or other information unless specifically acknowledged as been sourced from the person.

Signed: M.V Setshego Date: 21/01/2019

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As the candidate's supervisors, we agree to the submission of this dissertation.

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Dr W. Otang-Mbeng (Supervisor)

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PUBLICATION

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CHAPTER 1: GENERAL INTRODUCTION

1.1 Background

Since ancient times, natural resources have always been used as medicine due to their therapeutic efficacy, especially in rural areas where access to modern healthcare is limited. In addition, the popularity of ethnomedicine is attributed to its affordability and readily available (World Health Organization, 2000; Kamsu-Foguem and Foguem, 2014). Ethnomedicine employs the knowledge, skills and practices based on theories, beliefs and experiences of indigenous people to maintain their health (Mahwasane et al., 2013). In the 19th century, at least 80% of all medicines were derived from plant materials and were marginalized after the introduction of synthetic medicine (Gilani, 2005). However, in recent years, people are cognizant of the "holistic" natural treatment for diseases and are embracing the product developed from natural resources (Davis and Perez, 2009). In other words, the importance of indigenous knowledge in cosmeceuticals is gradually being discovered (Wang et al., 2006). The formal sectors draw from indigenous knowledge systems to meet with the international enthusiasms for innovation and development of natural products (Makunga et al., 2008).

Indigenous knowledge is the central part of human culture and has considerable value in development and innovation in cosmeceutical industry. Indigenous people have developed a strong relationship with nature and most of their activities require them to be on the field because they depend on it for their survival. Thus, their skins are often exposed to the sun and other environmental hazards that affect them. The appearance of the folk people mattered, though there were proverbs such as '*mosadi tshwene o jewa mabogo*' which means 'a woman's worth or beauty is seen on the work they do, not the appearance'. Therefore, they have always used the natural resources to improve their appearance and for skin treatment (Pieroni et al., 2004). Whereas, some people still consider natural products as primitive (Davis and Perez, 2009).

The skin is the largest part of body and its functions include protection, percutaneous absorption, temperature regulation, fluid maintenance, sensory and disease control (Abbasi et al., 2010). Currently, there is an increasing concern on the use synthetic products due to their toxicity and side effects. Sadly, some of the synthetic products

negatively affect the functions of the skin and may cause some major diseases, including cancer (Joshi and Pawar, 2015). The cosmeceutical products made from natural resources are safer than the synthetic because they supply the body with nutrients, enhance health, and provide satisfaction (Rigat et al., 2015, Joshi and Pawar, 2015). It is affirmed that certain natural substances are hypo-allergenic and are tested and proven by dermatologists to be safe (Joshi and Pawar, 2015).

1.2 Problem statement

Indigenous knowledge is not well known among the younger generations when compared to the older generations. Ethnobotanical knowledge on folk cosmeceuticals is disappearing quickly in recent times (Shaheen et al., 2014). This poses a threat of losing the possible solutions for dermatological problems such as bad odour, skin and hair disorder. Documentation of the indigenous knowledge about folk cosmeceuticals is vital and valuable. According to Afolayan et al. (2014), most medicinal plants have been recorded against different kinds of diseases. However, the documentation of ethnopharmacological applications is still lacking. The study attempts to provide answers to the main research question: "what are the natural resources utilized traditionally for cosmeceuticals by communities in Vhembe district?".

1.3 Aim and objectives of the study

The study aims to explore the ethnopharmacognosy of folk cosmeceuticals in Vhembe district municipality. The objectives of the study are:

- To identify the natural resources used as folk cosmeceuticals among the communities in Vhembe district.
- To document the indigenous knowledge and practices employed in the folk cosmeceuticals among communities in Vhembe district.

1.4 Research questions

This study is guided by the following questions:

- What are the natural resources used to enhance physical appearance, control odour and treat skin, mouth, hair, and nail diseases among the communities in Vhembe district?
- How do communities of Vhembe prepare and administer the folk cosmeceuticals?
- What are the indigenous knowledge and practices engaged in folk cosmeceuticals among the communities in Vhembe district?
- How do the socio-cultural factors influence the use of folk cosmeceuticals?

1.5 Justification

South Africa has 220 dermatologists for approximately 50.6 million residents, which makes it a ratio of 1 dermatologist is to 216 000 people, and they can mostly be found in private hospitals in urban areas (Dlova et al., 2018). The above statistics illustrate the value of folk cosmeceuticals among communities and highlights the gap that folk cosmeceuticals may fill among communities. Hence, this study will promote the use of folk cosmeceuticals by documenting them, and to thwart the loss of valuable knowledge that has a potential to be developed into skincare product(s). The sector of organic natural plants products is the fastest growing in the agribusiness industry (Makunga et al., 2008). Vermaak et al. (2011) affirmed that the natural skincare products is growing rapidly; it has been estimated that the industry is worth $12million (US dollar) in Southern Africa. This indicates an economic value of natural products and a prerequisite for more information regarding the natural resources utilized as cosmeceuticals.

Thus, the study of folk cosmeceuticals has the potential to provide new solutions and approaches to dermatological problems. Moreover, it will provide new knowledge that may lead to development of new drugs as well as benefiting the local community that possesses the knowledge (Rigat et al., 2015). Furthermore, the study will promotes and documents the indigenous knowledge on folk cosmeceuticals in order to preserve it from being lost.

Vhembe district is a suitable area for conducting the study. It is sometimes called 'a land of legends' because of her rich indigenous heritage, hence it is well known as a

cultural hub, catalyst for agricultural and tourism development. Vhembe district is largely rural withlarge female population, which tend to be the dominant gender regarding cosmeceuticals, mostly heading the households. Additionally, governancein Vhembe District is by both tribal and elected local government. As a result, the communities of Vhembe district might still possess knowledge regarding folk cosmeceuticals because they still adhere to their culture in these modern days of globalization.

1.6 Operational definitions, theories and paradigm

In this research study, folk cosmeceuticals are defined as plant and non-plant materials used to restore skin functions, protect from damaging, and prevent skin from environmental agents, insects and snakebite, harsh weather, poor diet, hormones, etc. Folk cosmeceuticals are holistic because of the knowledge that produces them. Hence, this study will also look at the indigenous practices that refer to the beliefs, theories and ideas concerning folk cosmeceuticals. The nature of the study allows the researcher to use the ethnography and consumer cultural theories because the ethnographic approach seeks to understand the perspective of ethnic group, and it is a theory of description. Moreover, consumer cultural theory addresses the relationship between folk people and the cultural meaning of folk cosmeceuticals utilized by them. The paradigm that guides the study is constructivism; also known as interpretivism, because its realities are socially and experientially based, local and specific in nature. This talks to the techniques that the folk people use to construct the folk cosmeceuticals in a unique cultural manner.

1.7 Organisation of the dissertation

Chapter 1: entails the introduction, which provides the background on the topic and highlights the aim, objectives and problem statement.

Chapter 2: explains the rigour of the study, research design and an overview of study area.

Chapter 3: focuses on conceptual framework, theoretical framework and review of existing knowledge on the utilization of natural products for cosmetics.

Chapter 4: provides the plant and non-plant resources used for cosmeceuticals in Vhembe district and outlines the methods of administration, plant family species, and commonly used natural resources.

Chapter 5: entails the Indigenous knowledge and practices employed in the preparation and use of folk cosmeceuticals among communities in Vhembe district.

Chapter 6: presents the major findings and conclusion of the study. In addition, the limitations, contribution of the study and recommendations are provided.

CHAPTER 2: GENERAL ORIENTATION OF THE STUDY

2.1 Introduction

Excessive research on some indigenous communities have caused the mistrust, animosity and resistance from indigenous people (Martin and Mirraboopa, 2003). The indigenous people were disrespected and treated as object because the research was undertaken without their permission and consent (Martin and Mirraboopa, 2003). Therefore, the orientation of this study is based on the approach that is suitable for indigenous people. The approach enables them to participate as partners with the academic researcher. The indigenous people are also considered as researchers rather than informers or respondents (Getty, 2010). The study is underpinned in indigenous methodologies and interpretivism (interpretivist/interpretive paradigm) because it is an indigenous knowledge system study conducted with indigenous people. Therefore, indigenous methodologies and interpretivism clearly guide the researcher to conduct indigenous study in a more appropriate way by assisting the researcher to understand how indigenous people view the world, so that the researcher may use the same lenses in process of research. It ensures that the research is carried out in a respectful, ethical, correct, sympathetic, useful and beneficial fashion, seen from the point of view of the indigenous people (Porsanger, 2004; Getty, 2010).

This chapter provides the rigour of the study, the research design and the synopsis of the study area. The rigour of the study is presented through the explanation of policies supporting the study, indigenous research methodologies and the philosophical underpinning.

2.2 Paraphrasing the research topic

The topic of the study is ethnopharmacognostic study of folk cosmeceuticals. The word 'ethnopharmacognostic' was derived from the word ethnopharmacology. Both words can be divided into three sections (ethnopharma-ology &ethnopharma-gnostic) which will indicate their differences. The difference between both words lies on the suffix. According to the English Oxford living dictionary (2018a), the -gnostic means relating to knowledge; on the other hand, -ology refers to a field of

knowledge. Therefore, the ethnopharmacognostic word inthe topic denotes the specificity of the knowledge that is required in the study, hence it is followed by the "of" preposition.

2.3 Policies relevant to the research

This study aligns with policies, which include the Indigenous Knowledge Systems policy and Convention of Biodiversity Act 1992. Moreover, from a global perspective, the focus of the research also aligns with some of the United Nations sustainable development goals (UN SDG, 2018).

2.3.1 Indigenous knowledge systems policy

The indigenous knowledge systems policy is a framework that inspires and strengthens the contribution of indigenous knowledge in social and economic development of South Africa (Department of Science and Technology, 2004). The policy is informed by other policies, inter alia, biotechnology, intellectual property, biological and natural genetic, culture and heritage. The policy is appropriate for this study because it is about indigenous knowledge concerning cosmeceuticals. The policy has four drivers, which include affirming the value of African cultures in the face of globalization, and driven by the practical measurement for the development of services provided by indigenous knowledge holders and practitioners, with a particular focus on traditional medicine. Moreover, the policy reinforces the contribution of indigenous knowledge to the economy in a way of creating employment and wealth. Lastly, it also interfaces indigenous knowledge with other knowledge systems for development.

The current study focuses on indigenous knowledge systems regarding the cosmeceuticals. Therefore, the policy supports this study by confirming the value of indigenous knowledge in globalisation. Nozizwe et al. (2014) asserted that globalization refers to the global sharing of ideas, cultures and economic links globally. The aim of globalization is to homogenize all practices and beliefs (Idakwo et al., 2017), reducing the whole world into a small community. Hence, this policy ensures that the value of African cultures is recognized by strengthening the African indigenous knowledge systems. Idakwo et al. (2017) emphasized that the West should cease relating with African cultures as if they are inferior to theirs. There is no

culture so rich that it does not benefit from being influenced by another. In other words, the integration of African indigenous knowledge systems with other knowledge is able to bring innovations and development in different fields of study. Therefore, the results of the study have the potential to be developed and be utilised for commercial purposes as supported by policy.

2.3.2 Convention of biodiversity

The Convention of Biodiversity is an international treaty that preserves the diversity of life through conservation and sustainable use (United Nations, 1992). It has three objectives, which include the convention of biodiversity; sustainable use of biodiversity; and benefit sharing. Cultures are established upon the different environments in which they have been developed, thus both culture and environment influence the indigenous knowledge in an area. The treaty underpins the study because it focuses on biodiversity, and the same aspect is the centre of the study. Furthermore, the study outlines the traditional techniques used for sustaining the availability of natural resources used for folk cosmeceuticals. Therefore, sustainable use of biodiversity is one of the objectives of this treaty hence it underpins the study. Draelos (2009) stated that discussions regarding folk cosmeceutical sustainability are necessary to properly manage the abundance of natural ingredients available for utilization. Article 12 of the Convention of Biodiversity Act articulates that the scientific and technical education and training programmes about the identification, conservation and sustainable use of biological diversity and its components should be established and maintained. Thus, invariably supports the study in a way that one of the objectives of the study is to identify the natural resources (both plants and non-plants) used for folk cosmeceuticals. Conservation of plants is among other intentions of identifying the natural resources used for folk cosmeceuticals, because by identifying, the experts will be able to assess their management and the range condition. Article 8(j) of Convention of Biodiversity act states that, subject to its national legislation, "parties have undertaken to respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such

knowledge, innovations and practices". Thus, this study will document the indigenous practices about cosmeceuticals, and by this, means, the study will promote the use of indigenous knowledge because documentation might lead to the utilization of the knowledge for development and innovation. The treaty protects the knowledge holders from being robbed of their intellectual property by declaring that there should be benefit sharing from the utilization of their knowledge.

2.3.3 United Nations (UN) sustainable development goals (SDGs)

The UN SDGs seeks to provide the management and acceleration of the action in promoting and coordinating the implementation of internationally agreed development goals (United Nations, 2015). Among the 17 SDGs, the two that underpin the study include good health and well-being (goal no 3), and life on land (goal no 15).

The goal on good health and well-being seeks to ensure a healthy life and promote well-being for all people of all ages. Although the focus of the goal is not necessarily on skin health, the goal supports the study because it promotes good health. The goal addresses the major priorities in health and one of them is to access safe, effective, quality and affordable medicine. The folk cosmeceuticals were utilized over time through generations and proven to be effective, easily accessible and affordable in rural communities. The increasing popularity and demand for natural product-based cosmetics can be attributed to their relative safety when compared to the synthetic product (Joshi and Pawar, 2015) .

Natural products are often produced from organisms such as plants, animals and microbes. Therefore, the life on land goal seeks to protect, restore and promote a sustainable use of terrestrial species. This goal underpins the study because it promotes the sustainable use and conservation of biodiversity. The study explores some of the practices used by communities to conserve the natural resources used as cosmeceuticals.

2.4 Indigenous research paradigm

Paradigm is a set of beliefs that influence the thinking, actions and assumptions about society and oneself, and they structure how one views the world (Wilson,

2001). It has to do with perception and how knowledge is acquired and what is counted as knowledge. Paradigm has its building blocks, which includes ontology, epistemology, methodology and axiology. Therefore, below is the discussion about the individual units constituting indigenous paradigm.

2.4.1 Ontology

Ontology is a belief about the nature of reality (Wilson, 2001). It is a way of being that reflects what believed in is real in the world. It is through ontology that one develops an awareness and sense of self, of belonging and for coming to know our responsibilities and ways to relate to self and others (Martin and Mirraboopa, 2003). The indigenous people perceive everything that has life sacred. Spirituality and reciprocity are two key elements of an Indigenous ontology (Hart, 2010). They perceive that nature interacts in a way that all living things co-exist in a reciprocal manner (Getty, 2010). Hart (2010) stated that how people see the world influences the understanding of what exist. In other words, the understanding of the interaction of nature (spirit, people, vegetation and animals) tends to influence how they relate to each other and raises awareness of how they depend on each other for survival. The indigenous worldview believes that every being has a role to ensure balance and harmony, and the overall well-being of life (Hart, 2010). The indigenous ontology states that the realities are not fixed and there are different levels of realities that are contextual and others held by knowledge holders (Walker, 2015).

2.4.2 Epistemology

Epistemology refers to how knowledge can be known (established) and answers the question of how we know what we know. It inquiries into the nature of knowledge and truth (Chilisa and Kawulich, 2012). Indigenous epistemology is a cultural group's way of conceiving knowledge; in other words, indigenous people construct their own knowledge (Gegeo and Watson-Gegeo, 2001). It is a process whereby knowledge is constructed and validated by the cultural group and used to shape the thinking and behaviour (Gegeo and Watson-Gegeo, 2001). It arises from the interrelatedness of the human world, the spirit and inanimate entities (Hart, 2010). In fact, indigenous people acquire knowledge from two spheres, that is, from spiritual world and the physical world. Furthermore, the indigenous epistemology validity is based on

connectivity, physical and spiritual nature of life, knowledge, and existence (Walker, 2015). Indigenous knowledge generally arises from observation and interaction with the biological and social environments, as well as from visions, stories and spiritual insights (Porsanger, 2004; Wilson, 2001). Hart (2010) emphasized that knowledge is constructed when an individual explores the spiritual forces inwardly and subjectively experiences a sense of wholeness; for exploration in this context means experience with the happenings whereby the findings become knowledge. Happenings may be through rituals or ceremonies that incorporate dreaming, visioning, meditation, and prayer. Hence, indigenous peoples' cultures recognize and affirm the spiritual through practical applications of inner-space discoveries (Hart, 2010).

2.4.3 Indigenous research methodologies

Indigenous methodology is a collection of indigenous and theoretical methodologies and strategies, rules and hypotheses utilized when conducting indigenous research with indigenous people (Porsanger, 2004). The indigenous research methodologies aim to decolonize the manner in which the research is conducted among indigenous peoples by confronting the ideologies of oppression. It changes the focus of indigenous researchers by shifting their worldviews so that they can come to the knowledge and understanding of the theories and things from the perspective of indigenous people (Louis, 2007). The indigenous methodologies are derived from the Afrocentric perspective that calls for a decolonization of validation of knowledge and representation. Therefore, the indigenous research methods should be aligned with the nature of indigenous knowledge (Khupe and Keane, 2017).

2.4.4 Axiology

Axiology refers to a set of morals and ethics (Wilson, 2001). Axiology analyses the values, ethics and principles to understand clearly their meaning, characteristics, origins, purpose and acceptance as truth. Ubuntu is an African philosophy used to conduct indigenous research. It embodies a humanist and collection of ethical philosophy. The Ubuntu philosophy means, "*A person is a person through the other person*"; it denotes that one should look if what s/he is doing is empowering the other person. Ubuntu philosophy enables one to express ethical values such as compassion, reciprocity, respect, dignity, humanity and mutuality in the interests of

building and maintaining communities with justice and communalities (Khomba and Kangaude-Ulaya, 2013). According to Hart (2010) , a researcher can demonstrate reciprocity by relating and acting with a community sharing and presenting ideas that will develop the community. The respect and responsibility can be demonstrated by communicating well with participants and by being trustworthy on what is heard, observed, and learned; hence the researcher will be honouring what is shared. Safety of the participants should be evident and that includes addressing confidentiality in a manner desired by the research participants (Hart, 2010).

2.5 Philosophical underpinnings of the study

Constructivism, also known as interpretivism, is one of the paradigms that align with the indigenous knowledge systems research. Therefore, interpretivism is a paradigm that explains and understands the world as others experience it (Chilisa and Kawulich, 2012). Ontology refers to assumptions about the nature of social realities (Chilisa and Kawulich, 2012). Interpretivism ontology believes that the realities are socially constructed. To affirm, interpretivism ontology is relativist and its realities are capable of being understood in the form of multiple, intangible mental constructions; socially and experientially based; local and specific in nature, although elements are often shared among many individuals and even across cultures, and dependent for their form and content on the individual persons or groups holding the constructions (Aliyu et al., 2014). In a similar manner, the study investigates the indigenous knowledge which is socially and experientially constructed in their specific area and that is shared through generations. The study seeks to understand the use of natural resources for cosmeceuticals from the perspective of indigenous people.

The interpretivism approach to research seeks to understand the experience of humans; therefore, the study has to take place in the setting of the participants so as to understand (Chilisa and Kawulich, 2012). The methodology used by constructivism leans towards the collection of qualitative data and uses methods such as unstructured interviews and participant observation (Fitzpatrick, 2012). The methods used are structured in a way to understand the world from the perspective of an individual or subjective experience. In other words, they use meaning orientated methodologies. The approach of the paradigm aims to explain the

subjective reasons and meanings that lie behind a social action. Hence, this study used the semi-structured questionnaire and observation tool to collect data; for both tools allows the researcher to explore the knowledge without imposing what s/he thinks knows.

The fundamental ethic or value in interpretivism (interpretive/interpretivist paradigm) is that of the care of participants. The indigenous paradigm is concerned with the meanings that people attach to norms, rules and values that regulate their interactions. Care is taken not to impose a previous understanding of norms, rules, and values on others but rather to understand their beliefs and actions from their perspective. The focus is not only on the reasons for their beliefs and actions but also on the social practices that underlie them. The ethical value that indigenous people use is consists of trust, love, respect, care, honesty, trustworthiness, and harmony. Researchers also consider the background, location and situation that those people are experiencing. For instance, there are villages where the traditional leaders would not allow the researcher to collect data before meeting up with the communities because of the dangerous activities that take place in their communities. The researcher had to respect that for the safety of both researcher and community members.

2.6 Research design and approach

A research design is the scheduling of conditions for collection and analysis of data in a way that aims to combine relevance to the research purpose (Selltiz et al., 1962). As explained by Sekaran (2003), research design is a setup to decide on, among other issues, how to collect data, analyse and interpret them to provide an answer to the problem. Triangulation is used in a study to obtain different but complementary data on the same topic to best understand the research problem (Creswell, 2009). Triangulation refers to a design in which researchers apply the quantitative and qualitative methods during the same timeframe and with equal weight (Creswell, 2009). Yeasmin and Rahman (2012) asserted that triangulation refers to a combination of two or more theories, methods and data sources in one study of a single phenomenon to unite on a single hypothesis, and can be employed in both qualitative and quantitative studies. Although triangulation is simultaneous, it separates collection and analysis of quantitative and qualitative data (Creswell,

2009). Moreover, a triangulation design is used to directly compare and contrast quantitative statistical results with qualitative findings or to validate or expand quantitative results with qualitative data. Therefore, in this study, qualitative data was used to validate quantitative data.

The study approach is inductive because it establishes clear links between the research objectives and the summary of findings derived from the collected data. The deductive approach usually moves from general to specific. The methodology used in the study is mixed methodology. According to Creswell (2009), mixed methods research is a mixture of both quantitative and qualitative methods and methodologies for conducting research that involves collecting, analyzing, and integrating into the same study.

2.7 Overview of the study area

Limpopo is the fifth largest province in South Africa. It is located at the northern part of South Africa and shares international borders with Botswana, Zimbabwe and Mozambique. It encompasses mostly rural areas and several ethnic groups, which include the VhaVenda, Tsongas, and Northern Sotho (commonly known as Bapedi). The number of households in Limpopo has increased from 1.4 to 1.6 million from 2011 to 2016 (Municipalities South Africa, 2016) . Limpopo is a savannah biome, although has a little bit of grassland and forest. It is known as a natural resource treasure of South Africa (South African Local Government Association, 2017) and is divided into five districts, namely: Capricorn, Mopani, Sekhukhune, Waterberg and Vhembe district.

The study focuses on Vhembe district municipality that covers approximately 25 597 km^2 geographical area in Limpopo province. The landscape in Vhembe is characterized by undulating rolling hills with flat plains occurring in the east. The topography is also characterized by the soutpansberg, the northernmost mountain range in South Africa (Limpopo Department of Economic Development Environment and Tourism, 2017). The VhaVhenda is the most dominant ethnic group in Vhembe district. The district settlement pattern is largely rural and a large portion of the land falls under tribal authorities, which possibly hinders development. However, there is potential for development in mining and tourism, especially eco-tourism.

Mapungubwe, an important archaeological and international heritage site, is located in the Vhembe-Dongola National Park. Both Mapungubwe and Thulamela are traditional heritage sites and examples of early settlement and culture in South Africa.

2.8 Concluding remarks

This chapter has highlighted the policies underpinning the study, epistemological grounding, and research design. The justification for the research approach and design have been elaborated, and an overview of the study area was provided.

CHAPTER 3: LITERATURE REVIEW

3.1 Introduction

The natural environment is what makes the knowledge of a people unique and different from that of another (Kuhnlein et al., 2013). Indigenous knowledge has sustained the local communities through the difficulties of their lives, including the harsh effects of the environment on their skin. The folk people's daily activities were mostly in relation to agriculture such as collecting wood, fishing, shepherding livestock, hunting, collecting water and wild food, which exposes them to the sun, insect bite, allergies, and snakebite that affect their appearance. The rich biodiversity is the basis of survival and well-being of local communities. It provides food, fodder, medicine, building materials, ingredients, and has several cultural and religious values (Rands et al., 2010). Therefore, the folk people would use natural resources to treat their skin and enhance their beauty based on their culture. The knowledge about the natural resources that are used as folk cosmeceuticals, and is gained and tested overtime by observation and experience of their environment as any other systems in indigenous knowledge.

Many studies have been conducted indicating the value of indigenous knowledge to cosmeceutical companies. Extracts from natural resource have been successfully been used in skin care due to its effectiveness and safety on skin. Martins et al. (2014) emphasized that the suppliers of the cosmetic industry are urged to include the extracts from natural resources because they contain properties such as vitamins and minerals that exert ultraviolet and anti-oxidant protection and general anti-aging benefits. Tan et al. (2018) asserted that recently the pharmaceutical industry is considering the antioxidants derived from natural resources such as plants, animals and microorganisms because natural resources contain chemicals that are valuable in cosmeceuticals. Costa and Santos (2017) affirmed that the natural antioxidants entail such health benefits as anti-aging, anti-inflammatory, and anti-microbial properties that are suitable for cosmetic purposes. Furthermore, the line between cosmetics and pharmaceuticals becomes blurry due to the requirements of health benefits in cosmetics.

3.2 Explanation of concepts

An explanation of the different concepts used in the current study is provided below.

3.2.1 Indigenous knowledge systems

Indigenous knowledge refers to knowledge, innovations, technologies, and practices of local communities developed from experience, gained over time and adapted to local culture and environment. According to Boven and Morohashi (2002), indigenous knowledge is specific and relative to an ethnic group, and in a unique manner to a given culture or society. Indigenous knowledge is the information base for a society, which facilitates communication and decision-making.It is a holistic knowledge that includes the belief systems, attitudes and values of the local people. In addition, it encompasses the knowledge that is anchored in a community and is a standard used through generations as guide of local communities in terms of their natural resources (Lutomia and Bello-Bravo, 2017).

3.2.2 Folk

The concept folk refers to any group of people whatsoever who share at least one common factor such as occupation, language, culture or religion; but what is important is that a group formed for whatever reason will have some traditions which it calls its own (Dundes, 1977). Folk can also be defined as a society that has its own way of doing things based on beliefs and values. Thus, folk can be compared to an ethnic group, which has its own traditions and culture.

3.2.3. Cosmetics

For many centuries, cosmetics were made to grant beauty, elaborate, or endorse it (Oumeish, 2001). Cosmetics mean skill in adornment and also mean correcting defects especially on face (Oumeish, 2001). Cosmetics also refer to personal care products that are intended to be rubbed, poured, sprinkled or sprayed on or introduced into or applied to any part of the human body: used to cleanse, beautify, promote attractiveness or alter the appearance (Joshi and Pawar, 2015; Wu et al., 2016). To emphasize more, cosmetic products are used or made for the sake of appearance (Oumeish, 2001). Pieroni et al. (2004) further explained that cosmetics are substances or preparations intended to be placed in contact with the various external parts of the human body (epidermis, hair system, nails, lips and external genital organs) or with the teeth and the mucous membranes of the oral cavity for the purpose of cleaning, perfuming, and or changing their appearance. They are a

range of products such as tooth paste, shampoo, conditioners, mascara, styling gel, creams, lotions, powders, perfumes, lipsticks, fingernail and toenail polish, eye and facial make-ups, permanent waves, hair colours, hair sprays and deodorants (Okereke et al., 2015).

3.2.4 Cosmeceuticals

These are products that are applied topically, and they include creams, lotions, and ointments. Cosmeceuticals are cosmetic-pharmaceutical hybrids intended to enhance beauty through ingredients that provide additional health-related benefits (Wu et al., 2016). In other words, the purpose of cosmeceuticals is to beautify and to restore the functions of the skin.

3.2.5 Pharmacognosy

An Austrian physician named Johann Adam Schmidt first coined the word pharmacognosy, derived from the Greek words "pharmakon" (drug) and "gnosis" (knowledge), in 1811. The concept of pharmacognosy has evolved over time. The contemporary definition of pharmacognosy is the "multidisciplinary science of natural drugs and drug substances that deals with medicinal plant cultivation, crude drug production, chemical; biological; pharmacological and molecular analysis of crude drugs and drug substances to assure their production, potency, purity and safety as well as to assist new drug discoveries" (Dhami, 2013). Heinrich et al. (2017) asserted that, traditionally, pharmacognosy focused on the study of basic drugs of natural origin, encompassing aspects such as authentication and quality control.

3.2.6 Ethno/ethnic

Ethno is a word mostly used as prefix. It is used to describe certain group of people and their culture. Ethnicity can refer to a group of people of the same descent and heritage who share a common and distinctive culture passed on through generations (Jandt, 2017). Ethnicity is a group of people possessing common characteristics, physical and mental features, and cultural and genetic heritage that differ them from the mainstream group.

3.2.7 Ethnopharmacology

Ethnopharmacology is defined as the most common strategy for the careful observation of the use of natural resources in folk medicine from different cultures; this is otherwise known as ethnobotany. Ethnopharmacology examines the relationship between humans and environment in all its complexities (Heinrich,

2014). Based on indigenous knowledge systems, Elisabetsky and Etkin (2009) defined it as a multidisciplinary area of research, concerned with the observation, description and experimental investigation of indigenous drugs and their biological activities. The term ethnopharmacology has undergone only slight evolution in meaning; its contemporary definition addresses the interdisciplinary study of the physiological actions of plants, animals and other substances used in indigenous medicines of past and present culture (Togola, 2008). It may be broadly defined as the study of the indigenous drugs from plants, mineral, fungi and animals used in past and present cultures (Kigen et al., 2013).

3.3 Conceptual framework

As illustrated in **Fig 3.1**, indigenous knowledge systems encompass knowledge that belongs to a specific ethnic group, and in a unique manner to a given culture or society and used as a standard in decision-making. The customs and values shared among the communities or societies become their culture. The environment influences indigenous knowledge systems, because it is derived from observation of natural resources, their interrelatedness and from the experience of the folk people in that environment. Ethnomedicine is one of the indigenous knowledge systems, which consist of the beliefs, skills and knowledge regarding health of the folk people. Ethnomedicine comprises the practices and knowledge in which remedies are formulated. Hence, ethnopharmacognosy refers to the strategy that carefully observes the use of natural resources in ethnomedicine. Specifically, the study will explore the folk cosmeceuticals, which is the hybrid of folk cosmetics and ethnomedicine. Folk and ethno (Vhembe district communities) are words that are used interchangeably; for they refer to a group of people of the same heritage, and this includes similarities of history, language, rituals as well as leisure pursuits (Sen and Chowdhury, 2006). Therefore, the study will evaluate the socio-cultural significance regarding the indigenous practices in the use of folk cosmeceuticals.

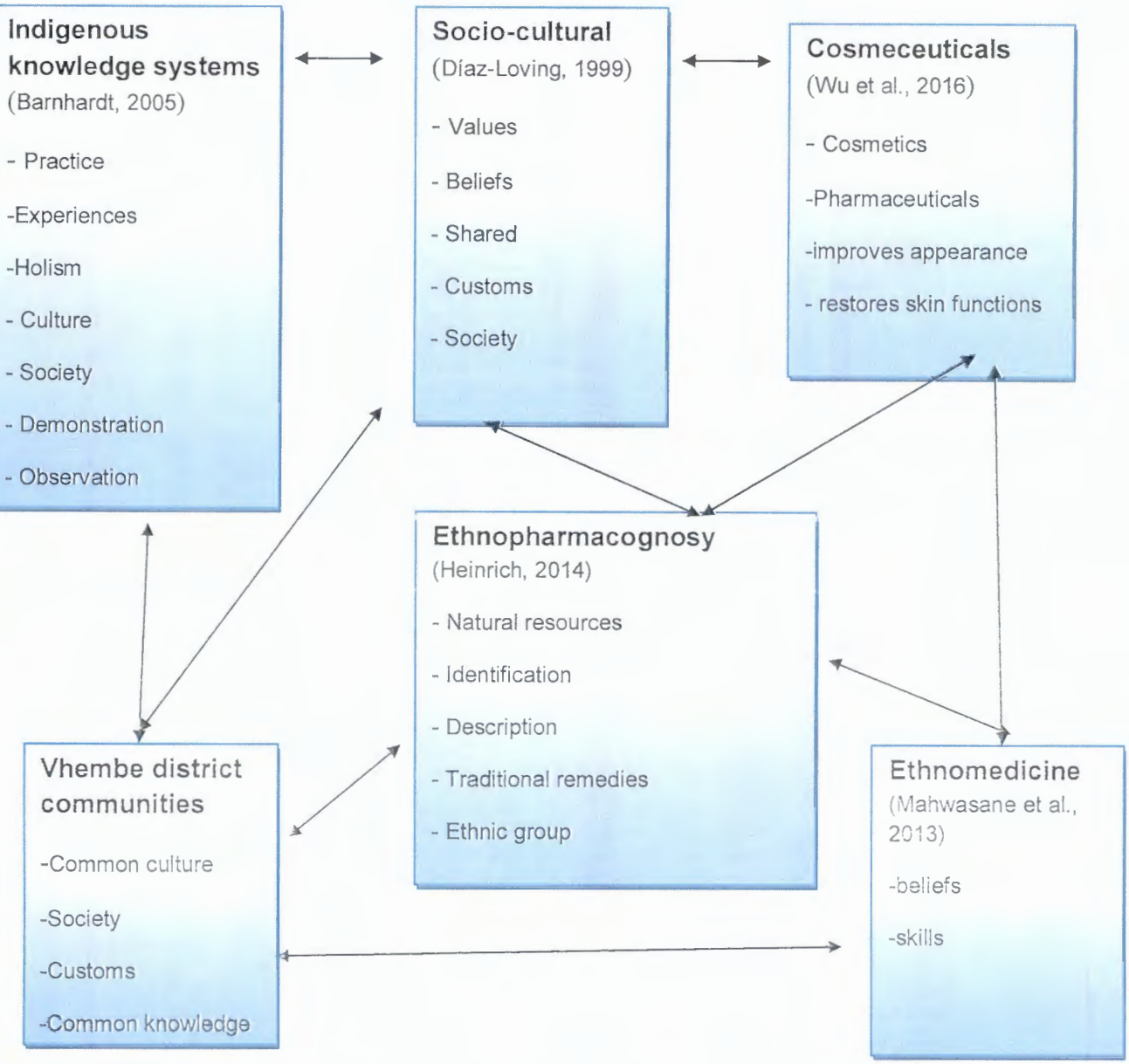

Figure 3.1: The relationship among the different concepts involved in the research

3.4 Theoretical framework

Consumer cultural theory addresses the dynamic relationship between consumer actions and cultural meanings (Arnould and Thompson, 2005). The action that the folk people take in using folk cosmeceuticals is informed by the meaning it has on their culture. It relates the culture lived and social resources. Indigenous knowledge about cosmeceuticals is passed through generations and has become a culture among the communities of the folk people. The same flora and fauna that indigenous communities share influence their culture; thereafter, culture influences the kind of

knowledge that those communities possess. Hence, there are cultural things that are shared by different ethnic groups. The study seeks to understand the relationship that the communities of Vhembe have with regards to the use of natural resources used for folk cosmeceuticals while still be able to distinguish different the cultures lived.Consumer culture theory focuses on the experiential and socio-cultural dimensions of consumption. Consumer culture theory has its historical roots and broadens its focus to investigate the neglected experiential, social, and cultural dimensions of consumption in context. There has been marginalization of indigenous knowledge regarding folk cosmeceuticals, therefore, the theory supports the study because the study explores the neglected knowledge that the communities of Vhembe used for dermatological problems.

Ethnographic theory is connected to the idea of holism; cultures are interconnected, not fragmented: they are whole systems (Nader, 2011). It is called theory of description, because it describes them as a whole (Nader, 2011). Every cultural aspect involved in the proposed topic should be included. The holistic aspect of ethnographic theory complements the holistic part of indigenous knowledge. The focus of the study is the indigenous knowledge focusing on cosmeceuticals. According to Goulding (2005), ethnography aims to explain the ways that culture constructs and is constructed by the behaviours and experiences of its members. For that reason, cultures provide diverse ways of interpreting the environment and the world as well as how they relate to other peoples. The study will explain how culture influences the use of folk cosmeceuticals and how cosmeceuticals are culturally composed. On the other hand, the study will compare with other studies conducted on other ethnic groups with different cultures. The potential for ethnography lies in applying multiple data collection methods at a single phenomenon.

3.5 Overview of ethnopharmacognosy.

Ethnopharmacology is an incorporation of social, natural and medical science. Generally, it is grounded in the approaches of sociocultural, natural and medical science (Heinrich and Jäger, 2015). Ethnopharmacology examines the relationship between humans and environment in all its complexity (Heinrich, 2014). It incorporates the social aspect by understanding the cultural methods of producing

medicine and the indigenous practices followed by different ethnic groups. This enables the study to reveal the unique culture practiced in different areas; therefore providing the study with more knowledge about the valuable natural resources used as medicine. The natural/medical science is revealed in a study when the researcher investigates the active ingredient of the natural resources. The investigation is an empirical one, where the pharmacological, phytochemical, and toxicology of traditional medicine is evaluated (Heinrich and Jäger, 2015).

Since ancient times, there has been a misconception regarding Africans and science. According to Gebre-Egziabher (1994), African science was not recognized because it was/is not separated from spirituality, culture, and everyday life. All traditional African cultures had magico-spiritual notions of disease. Hence in this setting, moral, social, or spiritual transgressions tend to lead to illness because they create both individual and communal disharmony (Gebre-Egziabher, 1994). Africans have contributed in the field of pharmacology. Africa has been a birth place of science because indigenous knowledge capability to cope with the environment and create value has a long history in the continent (Emeagwali and Shizha, 2016) .

Many studies that have been conducted showed that the effectiveness or activity of some Western medicines were first known or identified by Africans. For instance, the Bantu-speaking people utilized the bark of *Salix capensis* to treat musculoskeletal pains, and this genus of plants is known to contain salicylic acid which is the active ingredient of aspirin (Van Sertima, 1983). Furthermore, Nigerian doctors prepared a herbal concoction that treats skin infections and it was tested by Western doctors and was found to have powerful bactericidal activity against the organism that causes skin infections (Van Sertima, 1983). This is an indication of the value of indigenous knowledge

The process of ethnopharmacological research and drug discovery is multi-directional (**Fig. 3.2**). The summary of the process includes the ethnopharmacological survey, collection and identification of natural resources (plant, insect and microbes) used in folklore medicines. It also illustrates the pharmacological and toxicological evaluation of some traditional formulations/individual components/active ingredients to justify traditional claims and

to develop economic, safe, and novel therapeutic agents. Value is added to those bioactive components for commercial exploitation and the consumers are the knowledge holders.

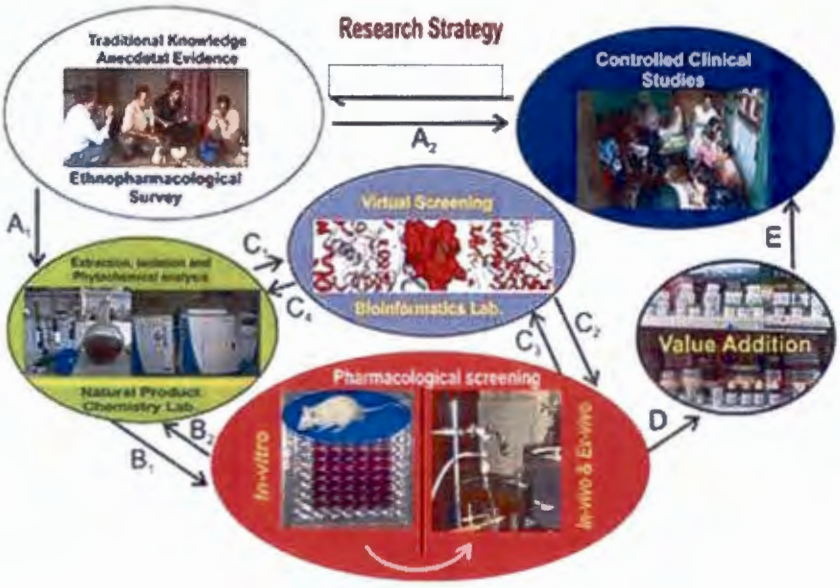

Figure 3.2: An overview of ethnopharmacognosy and drug discovery. (http://ibsd.gov.in/lokesh-deb/)

3.6 The contribution of indigenous knowledge systems to ethnopharmacognosy

The folk people influenced by their tradition have used the natural resources as cosmeceuticals. Makunga et al. (2008) asserted that the mode of knowledge that indigenous knowledge is, communicates the value of nature therefore creates a deeper appreciation of it. For the reason that, though traditional remedies are made of natural resources, they are a product of human knowledge (Reyes-García, 2010). To make a medicine concoction requires the knowledge about the plant, location of inhabitant, proper time to collect and it is collected; the part of natural resources to use; and methods of preparations and how to use. It is not only about the natural resource but also about the knowledge behind it.

Conversely, researchers focusing on ethnopharmacology have neglected the social and cultural aspect of ethnopharmacology. Anthropological expertise is utilized when the catalogue or list of folk medicine which were abstracted from the cultural context is obtained and for the reason of identifying the active components (Reyes-García,

2010). The effectiveness of ethnomedicine does not only count on the active compound in the natural resources but also on the cultural meaning it has (Moerman, 2007). The knowledge and use of traditional medicine is associated with supernatural powers, hence rituals and chanting of incantationsare required when using some of the medicines (Bhat and Jacobs, 1995). Authors continue to emphasize the issue of spirituality in traditional medicine by asserting that some of the diseases, including skin diseases, are caused by evil spells or disobedience to the gods (ancestors); therefore, the purpose of rituals is to appease the gods and ancestors. This connotes holism of indigenous knowledge systems in traditional medicine.

3.7 Common skin problems in Africa

Skin diseases are a major problem all over the world (van Hees and Naafs, 2009). Physical differences among human populations may lead to varying occurrence of skin disorders in different ethnicities (Bari, 2007) . According to Baird (1943), skin diseases can be classified into three, namely: living offenders (bacteria and parasites), abnormal forces (mechanicals and emanations as light, heat, cold etc.), and chemical substances (external applications and endogenous such as allergy). Some common skin problems are explained below:

- Rashes

A rash, also known as dermatitis, is an area of red, inflamed skin or a group of individual spots (Tabassum and Hamdani, 2014). Rash can be asymptom of other health conditions. Rashes (**Fig. 3.3**) can also signal a fungal or bacterial infection, or a minor symptom of a more serious medical problem.

Factors that can cause a rash include other diseases, irritating substances, allergies and the genetic makeup. Dry skin, exposure to poison oak and poison ivy, pets, food and consumer products all cause rashes. Ingredients in soaps, cosmetics, detergents, dyes, latex, deodorants, fragrances and rubber products can produce skin irritation and rashes.

Figure 3.3: Atopic dermatitis (*https://www.fondation-dermatite-atopique.org/en/patients-parents-family-space/news/atopic-dermatitis-and-dark-skin*)

- Viral infections

Viral infections are infections caused by viruses (DePietro and Hiugeria, 2017). People may be exposed to viruses by swallowing or inhaling them, by being bitten by insects, or through sexual contact (Kramer, 2018). Some of the examples of viral infection include warts (**Fig. 3.4**), chicken pox and measles.

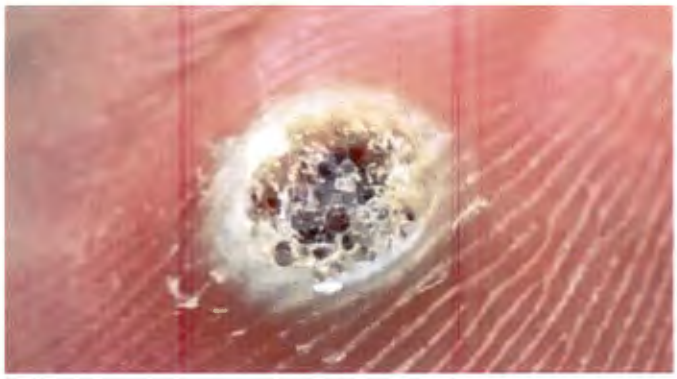

Figure 3.4: Warts viral infection (*https://www.activebeat.com/your-health/10-natural-home-remedies-to-banish-warts/3/*)

- Bacterial infections

Bacterial infections are caused by bacteria; in most cases, they occur when there is breaking of skin through cut or scratch. Bacterial skin infections often begin as small,

red bumps that slowly increase in size (DePietro and Hiugeria, 2017). For instance, cellulitis, impetigo (**Fig. 3.5**), boils, and leprosy are some examples.

Figure 3.5: Impetigo (*https://basicmedicalkey.com/alterations-in-the-integumentary-system/#s0150* as cited by_*Swartz MH:* Textbook of physical diagnosis, *ed 6, Philadelphia, 2010, Saunders, p 785.*)

- Fungal infections

Most fungal infections are caused by yeast such as *Candida* or *Malassezia furfur* and by dermatophytes such as *Epidermophyton, Microsporum*, and *Trichophyton* species (Aaron, 2018) . Fungal skin infections mostly appear on body parts that are moist such as between toes (**Fig. 3.6**), in genitals and under breasts (Aaron, 2018) . Some of the infections are non-contagious and are not life-threatening (DePietro and Hiugeria, 2017). Symptoms of fungal infections are strong itching, reddening, blistering and scaling.

Figure 3.6: Fungal skin disease between toes (*http://www.fixmyfeet.co.za/athletes-foot-tinea-pedis.html*)

- Tumours and cancers

Skin tumours develop because of propagation of a single or multiple components of the skin. The symptoms are smooth papules, nodules, keratotic or cystic injuries that grow slowly (Khandpur and Ramam, 2012) . Other symptoms are appearance of a shiny pink, red, pearly, or translucent bump (**Fig. 3.7**) and pink skin growths or injuries with raised borders that are crusted in the centre (Cole, 2018).

Figure 3.7: Translucent bump on skin indicating the sign of cancer (*http://skinofcolorsociety.org/dermatology-education/nonmelanoma-skin-cancer-nmsc/*)

- Pigmentation disorders

Pigmentation may be defined as colour changes occurring in the skin, hair and eyes due to genetic heterogeneity, levels and location of melanocytes and melanin producing cells (Engin, 2015) . Skin pigmentation disorders can cause an uneven skin tone or discolour the skin permanently or temporarily. Hyperpigmentation is one of the disorders caused by excessive melanin on the same spot of skin. Vitiligo (**Fig. 3.8**), an example of pigmentation abnormalities caused by loss of pigmentation on the skin is as shown in the picture below.

Figure 3.8: Vitiligo pigmentation disorder (*https://en.wikipedia.org/wiki/Vitiligo*)

- Trauma

The majority of skin trauma incidents cause minor injury that can be treated effectively in the outpatient setting (Pearson and Wolford, 2000). Abrasion (**Fig. 3.9**), erosion, ulcer and laceration are some of the trauma injuries.

Figure 3.9: Abrasion skin trauma (*https://www.healthline.com/health/bruisetypes-of-bruises*)

3.8 Factors influencing the occurrence of dermatological problems

The skin is exposed to everyday hostility, some more vicious than others and therefore threatens its equilibrium, functions, and visible beauty. The skin is exposed to chemical products, pollution, stress, irradiation from infrared and ultraviolet (UV) sources, and abrasion. The results or aftermath of this exposure might be visible or invisible on the skin such as inflammation, burns, edema, long-term illness, actinic

damage, and premature aging (Lintner et al., 2009). Most ethnodermatoses are influenced by cultural factors and cosmeceutical practices, which in turn are influenced by level of education, income and belief systems (Dlova, 2014). Ethnodermatosis is defined as those skin conditions specific to people of different ethnicity, and primarily black (Dlova, 2014). Indigenous health systems fight the diseases by firstly seeking to know the cause of it; hence, the factors that cause the occurrence of dermatological problems need to be included. Moreover, Marshall (1963) asserted that climate and nutrition, among other factors, contribute to the occurrence of dermatological problems.

3.8.1 Climate

Climate change is defined as "a change in the state of the climate that can be identified (e.g. by using statistical tests) by changes in the mean and/or the variability of its properties which persist for an extended period, typically decades or longer" (Pachauri et al., 2014). The change in climate affects skin because it is the most exposed organ on human body to the environment. Climate change is associated with the rise in temperature, the effects of which could be acute and chronic. The acute effects include sunburn, tanning, and immediate pigment darkening; and the chronic effects include skin cancer and photo-aging (Rajeshwari, 2009).

3.8.2 Nutrition deficiency

Malnutrition continues to be a major public health problem throughout the developing world, particularly in southern Asia and sub-Saharan Africa(Muller and Krawinkel, 2005). Malnutrition occurs when one does not consume sufficient or balanced macronutrients (protein, fats and carbohydrates) and micronutrients (vitamins and minerals). In fact, Kwashiorkor, among other diseases caused by insufficiency of macro-nutrients, occurs when there is protein deficiency with an overall near-adequate caloric intake (Lee and Yan, 2012). Kwashiorkor classically presents with flaky paint dermatitis, alopecia, lightening of hair pigmentation, change of skin and hair colour, as well as generalized edema (Muller and Krawinkel, 2005; Lee and Yan, 2012). The micronutrient deficiency occurs when there is a lack of minerals and vitamins. For instance, the deficiency of vitamin C causes the inflammation and progresses to necrosis, bleeding, and tooth loss on gingival mucosa (Lee and Yan, 2012).

3.9 An overview of natural resources used as folk cosmeceuticals

An overview of the natural resources used as folk cosmeceuticals globally by different ethnic groups is presented in **Tables 3.1** and **3.2**. Most of the studies recorded the plant materials as folk cosmeceuticals with little information existing on non-plant materials. Muda et al. (2017) asserted that the use of non-plant materials for beauty is an ancient practice and some of the ingredients that were used included milk, honey, clay and mud. However, there is still a gap in research where the non-plant materials are not recorded as most of the authors focused mainly on the plant materials. Pieroni et al. (2004) provided information on the use of both plants and non-plants as cosmeceuticals. Therefore, there is a need to record both non-plant and plant materials used as folk cosmeceuticals, hence the reason why the current study is centred on both.

Table 3.1: Selected examples of plant materials used as folk cosmeceuticals

Scientific name	**Part(s) used**	**Uses**	**Countr(ies)**	**References**
*Acacia karroo*Hayne	Bark, leaves and stems	Boils and ringworms	South Africa	Maroyi, 2017
Afromomium melegueta	Leaves	Small pox and chicken pox	Nigeria	Egharevba and Ikhatua, 2008
*Agapanthus africanus*Hoffmanns	Leaves	Rash	South Africa	Maroyi, 2017
Aloe vera	Gel	Body, visage and hair care, boils and dandruff	Cameroon Nigeria	Fongnzossie et al., 2017; Fred-Jaiyesimi et al., 2015; Rigat et al., 2015; Egharevba and Ikhatua, 2008
Arachis hypogae L.	Seeds	Gumming for skincare	Cameroon	Fongnzossie et al., 2018
Arnica montana L.	Inflorescence	Lotion	Spain	Rigat et al.,

Scientific name	Part(s) used	Uses	Countr(ies)	References
subsp.				2015
Baillonella toxisperma (Gaertn.f.) Hepper	Seeds	Body and hair care	Cameroon	Fongnzossie et al., 2017
Balsamita major(L.) Desf	Leaves	To strengthen the skin of babies; skin toner and perfuming (ritual)	Italy	Pieroni et al., 2004
Butyrospemum paradoxum	Fat	Moisturizer	Nigeria	Fred-Jaiyesimi et al., 2015
Calendula officinalis L.	flowers	Skin toner; to heal skin tears; anti-burns	Italy	Pieroni et al., 2004
Carica papaya	Roots, leaves, fruits and latex	Tooth hygiene, hair, body and visage care, sores	Cameroon Nigeria	Fongnzossie et al., 2017; Egharevba and Ikhatua, 2008)
Citrus limon (L.) Burm.f	Fruit	Body and visage care, whitens the skin of the hands, skin cracks, dandruff, hair shine and skin softness; skin rash	Cameroon, Spain, Italy, India, South Africa	Fongnzossie et al., 2017; Rigat et al., 2015; Fongnzossie et al., 2018; Pieroni et al., 2004;Shaheen et al., 2014;Maroyi, 2017
Cocos nucifera L.	Nut	Body cream	Nigeria	Fred-Jaiyesimi et al., 2015

Scientific name	Part(s) used	Uses	Countr(ies)	References
Croton zambesicus Müell. Arg.		Acceleration of hair growth	Cameroon	Fongnzossie et al., 2018
Datura stramonium L.	Leaves	For wounds and boils	South Africa	Maroyi, 2017
*Daucus carota*L.	Root	Skin toner, against burns	Italy	Pieroni et al., 2004
Elaeis guineensis	Fruits and seeds	Body, visage and hair care, gumming for skincare	Cameroon, Nigeria	Fongnzossie et al., 2017; Fred-Jaiyesimi et al., 2015; Fongnzossie et al., 2018
Gnidia capitata L.F	Roots	Ringworms and wound	South Africa	Maroyi, 2017
Gunnera perpensa L.	Rhizomes	Inflammations and wound	South Africa	Maroyi, 2017
Harpephyllum caffrum Bernh	Bark	Acne and eczema	South Africa	Ndawonde et al., 2007
Hypericum perforatum L	Flowering aerial parts	Relieve pain when swollen	Spain	Rigat et al., 2015
Hypoxis hemerocallidea Fisch. Mey. & Ave-Lall.	Bulb	Pimples	South Africa	Maroyi, 2017
Justicia flova(Vahl) Vahl	Leaves	Skin disease	Nigeria	Egharevba and Ikhatua, 2008
Lawsonia inermis L	Leaves, bark and seeds	Body cream, tattooing of hands and feet, nail varnish, dye hair, skin tonic	Nigeria, Cameroon, Italy	Fred-Jaiyesimi et al., 2015; Fongnzossie et al., 2018;Pieroni et al., 2004; , Egharevba and Ikhatua, 2008
Lilium candidum L.	Flower	Lotion	Spain	Rigat et al.,

Scientific name	Part(s) used	Uses	Countr(ies)	References
				2015
Lippia javanica (Burm. f.)	Leaves and roots	Chicken pox and wounds	South Africa	Maroyi, 2017
Peproma pelllucida	Whole plant	Wound	Nigeria	Egharevba and Ikhatua, 2008
Physalis angulata L.	Leaves	Burns	South Africa	Maroyi, 2017
Sanseveria libenica	Whole plant	Bad sores	Nigeria	Egharevba and Ikhatua, 2008
Sarcophyte sanguinea Sparrm.	Roots	Pimples	South Africa	Ndawonde et al., 2007
Thymus vulgaris L.	Flowering aerial parts	Bathing	Spain	Rigat et al., 2015
Tussilago farfara L.	Leaves	Heal wounds	Spain	Rigat et al., 2015
Zea mays L.	Seeds	Skincare, Skin toner, especially used for babies	Cameroon, Italy	Pieroni et al., 2004; Fongnzossie et al., 2018

Table 3.2: Selected examples of non-plant resources used for folk cosmeceuticals

Resources	Part used/products	Uses	Countr(ies)	Reference(s)
Ashes	Ashes	To give hair a special gloss and softness	Italy	Pieroni et al., 2004
Bees wax	Not indicated	To heal the hard, flaky skin of feet	Italy	Pieroni et al., 2004
Black cobra	Venom	skin rashes and eczema	Nigeria	Timothy et al., 2018
Charcoal	Not indicated	To whiten the teeth	Italy	Pieroni et al., 2004

Resources	Part used/products	Uses	Countr(ies)	Reference(s)
Clay	Not indicated	To give a special softness to skin and hair	Italy	Pieroni et al., 2004
Earthworm	Powder of the whole insect	Wound healing	India	Vijayakumar et al., 2015
Egg yoke	Not indicated	To strengthen the hair	Italy	Pieroni et al., 2004
Four-toed hedgehog	Thorns	Treat skin rash	Nigeria	Timothy et al., 2018
Garden snail	Muscus Saliva Slime	Wound Dark spot Skin lightning	India	Vijayakumar et al., 2015
Goat	Fat	Wound and toothache	Ethiopia	Kendie et al., 2018
Honey	Not indicated	To avoid swollen skin after a syringe injection. Warts Treatment of snake bites; Heal burns, hair loss	Italy, Ethiopia, Nigeria	Pieroni et al., 2004;Kendie et al., 2018;Timothy et al., 2018
Jackal dog	Fat	Skin diseases	India	Vijayakumar et al., 2015
Python	Fat Meat	Wound Foot cracks	Ethiopia	Kendie et al., 2018
Rat	Blood	Wart	Ethiopia	Kendie et al., 2018
Spotted hyena	Liver	Skin infections	Ethiopia	Kendie et al., 2018
Ticks	Blood	Fungal disease on the skin	Ethiopia	Kendie et al., 2018
Viper	Venom	Snake bite	Nigeria	Timothy et al., 2018

3.10 The practices of folk cosmeceuticals

The ethnopharmacognosy regarding the cosmeceuticals is an ancient practice. It is a practice that has been present through almost all civilization and has been used for several occasions such as burial, religion and everyday life for the preservation of health and beauty (Fongnzossie et al., 2018). Cosmeceuticals can be classified into three categories, namely: skin cosmeceutical products, hair cosmeceutical products and dental cosmeceutical products (Kumar, 2017). Therefore, the study looks only into dental and hair aspect of cosmeceuticals.

3.10.1 Folk cosmeceutical dentistry

Utilization of natural products for mitigating against different oral challenges had been highlighted. For instance, traditional healers reported treating patients with mouth problems with natural remedies (Puranwasi, 2005). Fresh leaves of African wormwood (*Artemisia afra* Jacq) are packed on a painful tooth to relieve pain, and a decoction might be held inside the mouth for gum disease. As indicated by Zhang et al. (2018),the people of Bulang, China had traditional techniques for oral health. They believe that they had to blacken their teeth with soot to ensure the healthiness of the teeth is maintained. One of the participants in the study claimed that she started to blacken the teeth while she was a teenager and, now at the age of eighty-two, her teeth are still strong and she has not lost any of them. The people of Bulang chew betel nut and/or apply the concoction of betel nut, lime, tobacco, gagai and galun leaves to clean and keep their teeth healthy and they use the slice of bamboo tree as tooth-brush (Zhang et al, 2018). The betel nut concoction was traditionally utilised to prevent toothache.

3.10.2 Folk hair cosmeceuticals

Hair has a significant role in human physical appearance and self-perception. Hair care includes hair quality and scalp care (Muda et al., 2017). Hair care products include shampoos, conditioners, serums, styling gels, colourants, sprays and glazes, scalp nourishing products, and masks. According to Sharma et al. (2003), there are a number of records in Ayurveda about the herbs which promotes hair growth, keeps them soft and silky, and helps not to lose its colour before time. Furthermore, they mentioned that herbs such as *Rubia cordifolia* Linn, *Acacia concinna* DC, and

Emblica officinalis Gaertn (Alma) are made into powder and applied on hair. For instance, the fruit of *Emblica officinalis* Gaertn (Alma) is dried and the powder from it used as shampoo.

3.11Socio-cultural factors influencing the use of folk cosmeceuticals

Ethnopharmacology is a combination of viewpoints, although many authors have neglected the bio-cultural perspective. The bio-cultural perspective emphasizes the cultural construction of health and healing that is negotiated socially. Cosmeceuticals are used as a sign of culture, class, religion, or another social group to which an individual belongs. They might additionally use it to show status, rank; or alternatively, riches inside a group, and in addition different personal information; for example, age, gender or regenerative cell status. Cosmetics utilization also incorporates mental meanings; for example, diminishing anxiety and expanding self-confidence (Bilal et al., 2016). Cosmetics are used differently depending on cultures as a means of communication (Patil and Bakkappa, 2012). Furthermore, the nature of cultural significance can be seen as a process from which meaning is created, maintained, and conveyed within a society.

Pieroni et al. (2004) provided an appealing explanation that aesthetics can only be defined within a given cultural group, and they are significantly affected by political, economic, and socio-cultural dimensions. In their submission, they noted that a broad spectrum of field studies would be necessary for analysing aesthetic systems under a cross-cultural perspective in order to better understand the socio-cultural significance of, and dynamic historical changes in, the use of traditional appearance-changing products.

Shaheen et al. (2014) indicated that the unavailability of health facilities, especially for skin, hair and other cosmetic problems, reflects the reason for the use of natural resources for cosmeceuticals. Furthermore, women use folk cosmeceuticals because they lack alternative choices, since most of them live in remote areas (Shaheen et al., 2014).

The belief in effectiveness of the folklore remedies is also the reason for the use of natural resources for cosmetics (Shaheen et al., 2014). The belief can be caused by

the results of the products utilized on the other person. Therefore, the relationship and trust built while perceiving people being healed by traditional practitioners can influence the use of folk cosmeceuticals (Gyasi et al., 2011). The traditional practitioner might be a family member, therefore the utilization of the traditional medicine becomes a family affair to the point that the gift of being a traditional practitioner is passed through generations (Kigen et al., 2013).

It is interesting to note that most South African initiation schools use soil during the initiation ceremony as part of their custom. The AmaXhosa culture knows the process of initiation as *ulwalukho,* which means the stage from boyhood to manhood (Mhlahlo, 2009). The second stage of initiation includes the painting of white or/and red clay on the body since they go about naked (Mhlahlo, 2009). Culturally, the white clay signifies purity and a new beginning as a boy changes into man (USAID/AIDSMark, 2005). Matike et al. (2010) affirmed that *ingceke* (white clay) is used for crawling children to protect their skin from dirt, insect bites and adverse effects of the sun. Therefore, this supports the effectiveness of white clay in initiation schools that are held in the wilderness where boys experience harsh insect bites and sun heat.

Poverty is a strong obstacle to the utilization of modern health services (Gyasi et al., 2011) . The authors reported that most people living in poverty find it hard to access the modern health services. Therefore, they utilize the alternative way, which is the indigenous way of enhancing their beauty and restoring their skin. However, some traditional practitioners utilize them to earn some income; although there are several false traditional practitioners, especially in urban areas, who are out to fleece and make quick cash from desperate patients (Kigen et al., 2013).

According to Satimia et al. (1998), age and education influence the use of folk cosmeceuticals. Generally, the youth prefer modern health systems to traditional health systems. On the other hand, older people prefer traditional health systems because they grew up using them and most of them had no access to modern healthcare systems and are unfamiliar with them.

3.12 Historical documentation of the ethnopharmacology in relation to the skin

The use of the natural ingredients such as herbs, roots, essential oils and flowers for skincare has a very long history in human civilization (Lall and Kishore, 2014). Scientifically, it has been a proven fact that natural ingredients are effective in smoothening, calming, restoring, and healing of skin and hair as well as perfuming and correcting body odours (Shaheen et al., 2014). Folk cosmetics consist of bioactive ingredients that rejuvenate, freshen and protect the hair and skin from various conditions such as psoriasis, eczema, skin dryness, skin cancers, sun burn, skin dryness, boil, solar keratosis, dermatitis, impetigo, candidiasis, athlete's foot, chicken pox, carbuncles, staph infections, cyst, abscess, cracking, dandruff, flaking and others (Atolani et al., 2016).

Ethnomedicine is used all over the world and it differs country by country, region by region, as they are influenced by factors such as culture, history, personal attitudes and philosophy (Togola, 2008). China is one of the countries where the use of ethnomedicine is enormous. According to Chen et al. (2016), Chinese ethnomedicine is one of the most commonly used alternative medicines in Taiwan due to its easy accessibility with full national health insurance coverage. The Chinese herbal medicine is habitually used to alleviate the harshness of acne by clearing heat toxins and dampness, which are regarded as the main causes of acne from the Traditional Chinese Medical perspective (Chen et al., 2016). The ethnomedicine is practiced or developed according to the way the sickness or disease is viewed by the folk people.

Zaid et al. (2017) conducted ethnopharmacological survey of home remedies used for treatment of hair and scalp and their methods of preparation in the West Bank, Palestine. Findings from the study indicated that many natural remedies are still used in Palestine for the treatment of scalp and hair disorders as well as for cosmeceutical purposes. Their study relates to this study in a way that it documented indigenous and cosmeceuticals, although it is limited only to the scalp; it indicates the value of indigenous remedies in treatment of the skin.

Furthermore, the traditional medical practice in Nigeria utilises many seed oils or medicinal plant extracts, which are cheaply sourced for skin and hair care products due to their abilities to rejuvenate, moisten and enhance strong skin and hair. The seeds produced from plants usually contain lipids, fatty acids, amines, proteins and

esters are essential for maintaining body skin function. Sadly, many of the valuable seeds that are oil-rich are allowed to perish each year because they belong to non-conventional oil (Atolani et al., 2016).

On other hand, Jumbam (2012) conducted a study about the rare beauty spa called Isinuka traditional spa situated in the Transkei region of Eastern Cape Province, South Africa. The spa used as a source of livelihood by local people of Transkei region uses natural substances such as clay, spring water, and rocks to inhale gases oozing out of it. According to Jumbam (2012), the black and white clay are used to protect people from dangerous sunrays and skin blemishes, to smoothen the skin and fend off evil spirits. Additionally, the clay could be applied immediately after bathing in the pond, without bathing, or it is simply taken home for later applications. On another hand, spring water is used for bathing to heal painful knees, sore feet, acne and pimples, stress, general cleansing, skin problems, body pains, for the purpose to refresh and rejuvenate the body and to remove bad luck. Above all, the Isinuka traditional spa is used for a holistic healing and beauty system. The natural resources used are sacred and preserved from being defiled so as to appease the ancestors.

CHAPTER 4: NATURAL RESOURCES USED FOR COSMECEUTICALS AMONG COMMUNITIES IN VHEMBE DISTRICT

4.1 Introduction

The use of natural resources, especially the plant material, for skin diseases and cosmeceutical purposes is an ancient practice in many cultures globally (Pieroni et al., 2004). Natural resources refer to substances that occur naturally and include plants, animals and microorganism. Plant-derived extracts are more common than animal-derived extracts as a source of cosmeceuticals (Aburjai and Natsheh, 2003). Despite the marginalization of folk cosmeceuticals and the introduction of synthetic ones, natural resources are still utilized for skin health in many rural areas globally (Mahomoodally and Ramjuttun, 2016; Fongnzossie et al., 2017; Pieroni et al., 2004; De Wet et al., 2013). The ease of access and belief in the efficacy of indigenous knowledge are possible reasons for the continuous dependence on these natural resources.

The bio-compounds from natural resources have been successfully used in skincare treatment due to their effectiveness and safety. Martins et al. (2014) emphasized that the suppliers of the cosmetic industry are urged to include extracts from natural resources because they contain essential vitamins and minerals that exert ultraviolet and antioxidant protection and general anti-aging benefits. Recently, the pharmaceutical industry is considering the antioxidants derived from natural resources such as plants, animals and microorganisms because they contain chemicals that are valuable in cosmeceuticals (Loh et al., 2018). Furthermore, natural antioxidants provide health benefits such as anti-aging, anti-inflammatory, and anti-microbial properties that are suitable for cosmetic purposes (Costa and Santos, 2017) .

The demand for natural resources for cosmeceuticals is increasing globally. The use of traditional plant-based remedies remains entrenched in the healing practices of developing countries (Makunga et al., 2008). South Africa, as one of the developing countries, encompasses areas such as Vhembe district that are still under the governance of traditional leaders that encourage and preserve the culture of the communities. According to Stats-SA (2018), South African people consult both public

health facilities and traditional practitioners for their illnesses, including the communities of Vhembe district. Vhembe is mostly rural and comprises 165 healthcare facilities, which include local clinics, community healthcare centres, district hospitals and mobile clinic services. However, the utilization of natural resources for health purposes is still well practiced.

Even though several ethnobotanical studies have been conducted in Limpopo province, including Vhembe district (Mahwasane et al., 2013; Constant and Tshisikhawe, 2018; Arnold and Gulumian, 1984; Mabogo, 1990; Magwede et al., 2018; Mongalo and Makhafola, 2018), specific attention on natural resources utilized as cosmeceuticals for skin diseases remains understudied. While Mabogo (1990) documented 44 plants with cosmeceutical potential, Mahwasane et al. (2013) and(Magwede et al., 2018) recorded 2 and 13 plants, respectively. A recent study by Constant and Tshisikhawe (2018) did not highlight any plant with cosmeceutical value. Thus, the current study aims at documenting natural resources used as folk cosmeceuticals among households in rural communities located in Vhembe district.

4.2 Methodology

4.2.1 Study area

The study was conducted in six villagessituated in the northern side of Limpopo Province, South Africa **(Fig. 4.1)**. Vhembe district has a population of 1 393 949 with 382 346 households (Stats-SA, 2016). It comprises four local municipalities, namely Thulamela, Collins Chabane, Makhado, and Musina. Vhembe District Municipality is predominantly rural, with more than 85% of its population living in tribal settlements and farms, and only 5% living in urban areas (Massyn et al., 2015).

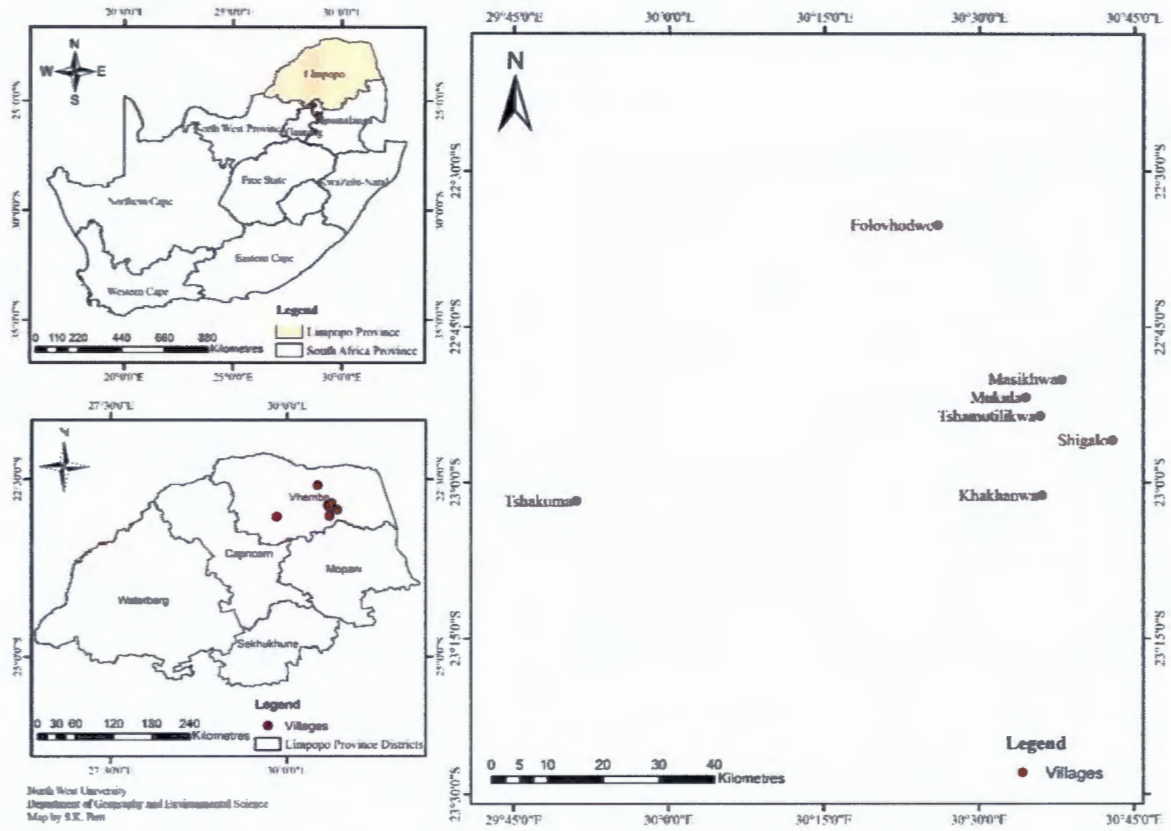

Figure 4.1: Selected villages in Vhembe district, Limpopo Province, South Africa

4.2.2 Ethnopharmacognostic survey

4.2.2.1 Target population

The target population of the study were the community members in Vhembe district. The population consisted of traditional practitioners, herbalists and laymen with no restriction of age or gender. The members who participated are knowledgeable about the natural resources used for folk cosmeceuticals and some of them practiced and used folk cosmeceuticals, particularly the traditional practitioners.

4.2.2.2 Sampling procedure and sample size

Snowballing and convenient samplings were used to sample the population. The researcher first entreated the traditional leader to lead the researcher to knowledgeable people, and then requested the participants to lead them to other people that might have knowledge about folk cosmeceuticals. Convenient sampling

was used by asking questions from community members that were willing to participate. This sampling method was adopted to provide the community members the freedom to choose whether to participate or otherwise. In fact, those who are not interested in participating in the study referred the researcher to the people who were known to have the required knowledge. **Table 4.1** indicates the sample size of the participants from each community where the research was conducted.

Table 4.1: Sample size of the study participants in Vhembe district, Limpopo Province, South Africa

S/N	**Village**	**Number of participants**
1	Tshamutilikwa	7
2	Luvhimbi	8
3	Khakhanwa	3
4	Shigalo	22
5	Tshakuma	25
6	Folovhodwe	6
	Total	**71**

4.2.2.3 Research tools and piloting

The semi-structured questionnaire **(Appendix 1)** was used to collect data from the community members. The questionnaire was divided into four categories. Category A entailed the interview log that requested information about the name of community, date of data collected, local municipality, and demography of participants. Category B comprised enquiries about natural resources utilised for folk cosmeceuticals, method of preparations and administration and part used. Category C consisted of indigenous knowledge and practices involved in the formulation and use of folk cosmeceuticals; factors influencing the use of folk cosmeceuticals. Lastly, Category D comprised questions about the techniques used to ensure the availability of folk cosmeceuticals

Pilot study was conducted in North West University, Mmabatho by interviewing five people to test the questionnaire. The language, length and the manner in which the questions were constructed were tested so that they could be modified before their utilization for the study. Therefore, the researcher eliminated some of the unnecessary questions that were making the research tool too long.

4.2.2.4 Data collection

The interview was conducted in Tshivenda and Xitsonga with the assistance of two translators. Some of the interviews were conducted in an informal gathering, although the original intention of the researcher was to interview one person at a time. Interviewing participants that gathered informally contributed a lot to the study. It was observed that some of the participants would only contribute their knowledge when they were in a group, which benefited the researcher in saving time and helping to gather more data.

4.2.2.5 Plant collections and identification

Plants were collected from both home gardens and natural vegetation during the fieldwork with the assistance of knowledge holders and translators (**Fig. 4.2**). The permission to collect the required specimens was granted by traditional leaders. Voucher specimens of the plants were deposited at the herbarium of the South African National Biodiversity Institute (SANBI), Pretoria for identification. Plants were also identified with the relevant books and with the assistance of an expert (botanist).

Figure 4.2: Plant collection with research assistant

4.2.2.6 Data analysis

The data analysis was carried out using inferential statistics, utilizing percentage and frequency. Data from the questionnaire was analysed using IBM SPSS analytical tool, Microsoft excel 2016. Ethnobotanical indices such as use-value of species and Relative frequency of citation were calculated.

Relative frequency of citation of natural resources was calculated as follows: FC (the number of informants mentioning the useful species) divided by the (total number of participants participating in the research.) or (*Frequency of citation (FC)* divided by sum of the participants *(N))*. The formula is $RFCs = FC/N$

Use-value of the natural resources was calculated as follows: $UV = \sum U/n$ where $\sum U$ is the number of different uses mentioned by each participant and N is the total number of informants interviewed in the survey.

4.2.3. Ethical considerations

Data was collected with full agreement with the participants and consent forms **(Appendix 2)** were issued to them, which clearly stated and explained that the participants were volunteering and the details of the study, which included aim, objectives and how data were going to be collected. In other words, if a person was willing to participate, the consent form for permission, interview and publishing of results was granted. The ethical clearance (NWU-07740-17-A9) **(Appendix 3)** was obtained from the research ethics committee of North West University, Mmabatho, South Africa. Moreover, the permission letter **(Appendix 4)** to conduct research in six communities was granted by the traditional leaders before collecting data from community members.

4.3 Results

4.3.1 Demographic characteristics of participants

In the current survey, 71 participants were interviewed with diverse demographic characteristics **(Table 4.2)**. The majority (76%) of the participants were females and the dominant (35%) age group was those individuals older than 70 years. Majority of the participants belonged to the Venda tribe (66%) and most of the participants lacked any kind of formal employment.

Table 4.2: Demographic characteristics of participants in the study area

Demographic features	Frequency	Percentage (%)
Gender		
Male	17	24
Female	54	Page
Age		
31-40	9	13
41-50	6	8
51-60	15	21
61-70	16	23
71-above	25	35
Type of employment		
Not employed	65	92
Informal	5	7
Formal	1	1
Monthly income		
<500	20	28
500-1500	13	18
1501-3000	38	54
Tribe		
Vhavenda	47	66
Tsonga	21	30
Other	3	4

4.3.2 The natural resource used for folk cosmeceuticals

In total, 54 plants from 27 families used for folk cosmeceuticals were recorded (**Table 4.3; Fig. 4.3**). As shown in **Fig. 4.3**, most of the plants belong to the following families: Leguminosae/Fabaceae (6) Ebenaceae (5), Poaceae (5), Euphorbiaceae (4), Anacardiaceae (3), Compositae/Asteraceae (3) and Rutaceae (3). Among the 54 plant species, the frequency of citation was in the following order: *Dicerocaryum*

zanguebarium (0.85), *Ricinus communis* (0.28), and *Helinus integrifolius* (0.18), *Zea mays* (0.16) and *Euclea divinorum* (0.093).

In total, 21 non-plants were recorded that are used for folk cosmeceuticals among rural communities in the study areas (**Table 4.4**). The most common non-plant materials include ashes, pig fat, ochre (Luvhundi soil), stone, python fat and soot. A quantitative analytical tool was used to calculate the use-value index of the species. It was employed to verify the ethnopharmacognostic information of folk cosmeceuticals in the study area. The findings indicated that *Aloe barbadensis* (0.084), *Euclea divinorum* (0.084), *Piliostigma thonningii* (0.070) and *Citrus limon* (0.056) have high use-value among plant species in the study (**Table 4.3**). At the same time, ashes (0.056), pig fat (0.056), python fat (0.042) and ochre (0.042) have high use-value among non-plant resources (**Table 4.4**).

Table 4.3: Plants used as folk cosmeceuticals among rural communities in Vhembe district, Limpopo province, South Africa

Scientific names (Voucher number)	*Common name(s)	Family	Part(s) used	Frequency index	Use-value	$RFC	Method of preparation and administration	Life-form	*Location
Acmella caulirhiza Delile Syn: *Eclipta filicaulis* Schumach. & Thonn. (MVS 007)	Tshishengeraphofu (V)	Compositae/ Asteraceae	Leaves	2	0.042	0.03	The leaves are crushed and mixed with water to wash wound so as to enhance healing. The crushed leaves areinfused in water to wash sores. The powder of the crushed leaves is mixed with saliva andapplied topically for woundhealing.	Herb	LVB TKM
Albizia harveyi E.Fourn. (MVS 019)	Molela (X) paperbark false-thorn (E)	Leguminosae /Fabaceae	Roots	1	0.014	0.01	The roots are burned and applied to remove rash	Tree	SGL
Aloe barbadensis Mill. (MVS 031)	Mhangani (X)/ Tshikopa (V) Aloe (E)	Xanthorrhoeaceae	Leaves	5	0.084	0.07	The liquid from the leaves isapplied topically to remove ringworms, moisturize the skin, and remove stretch marks, rash and to heal burnt skin and wound.	Herb	LVB TMTL TKM FLVD SGL
Annona senegalensis	Muembe (V)	Annonaceae	Twigs	11	0.01	0.15	The twig is crushed and used as	Shrub	TKM

Scientific names (Voucher number)	*Common name(s)	Family	Part(s) used	Frequency index	Use-value	$RFC	Method of preparation and administration	Life-form	*Location
Pers. (MVS 005)	African Custard-apple (E)				4		toothbrush to clean the teeth		LVB
Bidens pilosa L. (MVS 047)	Mushidzhi (V) Black jack (E)	Compositae/ Asteraceae	Leaves, Fruits	1	0.038	0.01	The leaves are crushed and the liquid applied on wound. The fruit juice is mixed with ashes to remove rash.	Herb	LVB
Cassia occidentalis L. (MVS 037)	Nembenembe (X) Munembenembe (V) Coffee senna (E)	Leguminosae /Fabaceae	Leaves	2	0.038	0.03	The leaves are crushed and madeas paste to apply on burn skin and for wound healing.	Shrub	LVB SGL
Citrus limon (L.) Osbeck (MVS 002)	Tshikavhave (V) Lemon (E)	Rutaceae	Fruits	3	0.056	0.04	Juice from the fruit is applied on the skin for moisturizing, removing wrinkles, scars and pimples.	Tree	TKM FLVD SGL
Citrus reticulata Blanco (MVS 050)	Swiri (V) Orange (E)	Rutaceae	Fruits	2	0.038	0.03	The fruit is cut to release liquid and is applied on the skin to clean and soften it.	Tree	LVB

Scientific names (Voucher number)	*Common name(s)	Family	Part(s) used	Frequency index	Use-value	$RFC	Method of preparation and administration	Life-form	*Location
Combretum imberbe Wawra (MVS 038)	Mondzo (X) Leadwood (E)	Combretaceae	Bark	1	0.014	0.01	The bark is ground and mixed with water to remove sores by bathing.	Tree	SGL
Cussonia spicata Thunb (MVS 040)	Musenzhe (V) Cabbage tree (E)	Araliaceae	Leaves	1	0.014	0.01	The leaves are crushed and applied as paste on ringworms to heal it.	Tree	TKM
Dicerocaryum zanguebarium (Lour.) Merr. (MVS 022)	Dinda (X) /museto (V) Boot protectors (E)	Pedaliaceae	Leaves	61	0.042	0.85	The leaves are mixed with water for bathing; also relaxes hair and removes dandruff.	Herb	TKM TMTK LVB KKN FLVD SGL
Dichrostachys cinerea (L.) Wight & Arn. (MVS 011)	Murenzhe (V) Sickle bush (E)	Leguminosae /Fabaceae	Fruits, Bark	2	0.042	0.03	The fruit is burned and the ashes applied for wound healing. The bark is crushed and mixed with oil to remove ringworms.	Shrub	TKM KKN

Scientific names (Voucher number)	*Common name(s)	Family	Part(s) used	Frequency index	Use-value	$RFC	Method of preparation and administration	Life-form	Location
							The bark is boiled and the water used to wash wound.		
Diospyros lycioides Desf. (MVS 025)	Muthala (V) Quilted Bluebush (E)	Ebenaceae	Twigs, Fruits	3	0.038	0.04	The twig is crushed to clean the teeth. The fruit is cut and placed in water to wash wound	Shrub	TKM LVB
Diospyros mespiliformis Hochst. ex A. *DC.* (MVS 017)	Ntoma (X) Musuma (V) Jackal berry (E)	Ebenaceae	Fruits, Leaves, Twigs	5	0.042	0.07	The leaves and fruits are squashed andthe liquid applied on ringworms to remove them. The twig is crushed to clean the teeth.	Tree	TMTK TKM KKN SGL
Diospyros natalensis (Harv.) Brenan subsp. (MVS 043)	Xintomatomane (X) Acorn Jackal-berry (E)	Ebenaceae	Twigs	3	0.014	0.04	The tip of twig is crushed and used to clean the teeth	Tree	SGL
*Dombeya rotundifolia (*Hochst.) Planch	Tshiluvhari (V) Wild Pear/plum (E)	Malvaceae	Leaves	1	0.038	0.01	The leaves are crushed and mixed with water to wash and dye hair	Tree	KKN

Scientific names (Voucher number)	*Common name(s)	Family	Part(s) used	Frequency index	Use-value	$RFC	Method of preparation and administration	Life-form	^Location
(MVS 036)									
Euclea divinorum Hiem (MVS 013)	Nhlangula (X) /mutangule (V) Magic guarri (E)	Ebenaceae	Leaves	7	0.084	0.10	The crushed leaves are mixed with water or the leaves are boiled together with water to bathe with to remove skin irritation, ringworms, rush, pimples, chicken pox.	Shrub	LVB KKN TKM SGL
Eugenia natalitia Sond. (MVS 001)	Tshitanzwa-tanzwane (V) Forest Myrtle (E)	Myrtaceae	Roots	1	0.014	0.01	The roots are ground and soaked in water to wash sores.	Shrub	TMTK
Gardenia volkensii K. Schum. (MVS 020)	Tshiralala (V) bushveld gardenia (E)	Rubiaceae	Flowers	1	0.014	0.01	The flower is mixed with water to bathe with to control odour.	Tree	FLVD
Helinus integrifolius (Lam.) Kuntze (MVS 032)	Mpupungwa/ mugumwa (V) Soap Bush/Plant (E)	Rhamnaceae	Leaves	13	0.038	0.18	The leaves are mixed with water to make foam to bathe and wash hair.	Shrub	TKM TMTK

Scientific names (Voucher number)	*Common name(s)	Family	Part(s) used	Frequency index	Use-value	$RFC	Method of preparation and administration	Life-form	*Location
Heteromorpha arborescens (Spreng.) Cham. & Schltdl. (MVS 008)	Muthathavhanna (V) Parsley tree (E)	Apiaceae	Leaves	1	0.014	0.01	The leaves are squashed and applied as paste for burnt skin healing.	Tree	LVB
Hyperacanthus amoenus (Sims) Bridson (MVS 049)	Murombe (V) Spiny-gardenia (E)	Rubiaceae	Fruits	1	0.014	0.01	The fruit called thomba liquid is applied on pimples to remove them.	Shrub	TKM
Indigofera arrecta Hochst. ex A. Rich (MVS 034)	Muswiswa (V) Java indigo (E)	Leguminosae /Fabaceae	Twigs, Leaves	2	0.042	0.03	The twig is crushed and used to clean the teeth. The tip of twig is crushed and is dipped in ashes to clean the teeth. The leaves are infused in water for bathing	Herb	TKM
Jatropha curcas L. Syn: *Castiglionia lobata* Ruiz & Pav.	Mupfure donga (V) Barbados nut Bubblebush (E)	Euphorbiaceae	Stems, Leaves Roots	6	0.038	0.08	The leaves are crushed and stem is cut, then liquid is applied to moisturize the skin The roots are ground and	Shrub	TMTK TKM

Scientific names (Voucher number)	*Common name(s)	Family	Part(s) used	Frequency index	Use-value	$RFC	Method of preparation and administration	Life-form	*Location
(MVS 004)							soaked in water to wash wound.		
Jatropha zeyheri Sond. *Syn:Jatropha brachyadenia* Pax & K.Hoffm. (MVS 052)	Xidemeja (X)	Euphorbiaceae	Leaves	1	0.014	0.01	The leaves are squashed and applied as paste for wound healing.	Herb	SGL
Lannea stuhlmannii (Engl.) Engl. (MVS 039)	Ndivata (X) False marula (E)	Anacardiaceae	Leaves	1	0.014	0.01	The leaves are crushed thensmeared on wound to heal it.	Tree	SGL
Lippia javanica (Burm. f.) Spreng (MVS 041)	Musudzungwane (V) Fever tea (E)	Verbenaceae	Leaves	4	0.038	0.05	The leaves are rubbed on skin to remove rash. The leaves are crushed and rubbed with oil on the body to remove rash.	Shrub	TKM TMTK KKN
Musa acuminata Colla	Muova (V)	Musaceae	Flowers,	4	0.038	0.05	The leaves *and* heart of flower of banana are cut and the liquid	Tree	TKM

Scientific names (Voucher number)	*Common name(s)	Family	Part(s) used	Frequency index	Use-value	$RFC	Method of preparation and administration	Life-form	*Location
(MVS 028)	Banana (E)		Leaves				applied on wound and burn skin.		LVB
Obetia tenax Friis Syn*: Urera tenax* N.E. Br. (MVS 006)	Thanga (V) Rock tree (E)	Urticaceae	Seeds	2	0.014	0.03	The seeds are ground to moisturize the skin.	Tree	TMTK FLVD
Peltophorum africanum Sond. (MVS 012)	Musese (V) African Black Wattle (E)	Leguminosae /Fabaceae	Bark	1	0.014	0.01	The bark is boiled and drunk to heal mouth sores.	Tree	TMTK
Persea americana Mill. (MVS 052)	Afukhada (V) Avocado (E)	Lauraceae	Seeds, Fruits	6	0.042	0.08	The seeds are crushed and used as face wash to remove blackheads on the skin. The fruit is rubbed on the skin to moisturize and soften it.	Tree	TKM KKN FLVD
Phragmites mauritianus Kunth	Lutanga (V) Lowveld Reed (E)	Poaceae	Thorns whole	3	0.038	0.04	The thorn is used to prickle moles to remove them The whole plant is burned and	Grass	TMTK TKM

Scientific names (Voucher number)	*Common name(s)	Family	Part(s) used	Frequency index	Use-value	$RFC	Method of preparation and administration	Life-form	*Location
(MVS 014)			plant				the ashes applied for removal of stretch marks		
Piliostigma thonningii (Schu- mach.) M.-Red (MVS 018)	Xidengana/ denga (X) camel's foot (E)	Leguminosae /Fabaceae	Fruits	5	0.070	0.07	The fruit is burned and mixed with oil, which is applied on ringworms, sores and for skin irritation. The liquid from fruit applied to remove pimples and wound.	Shrub	SGL
Poaceae (MVS 003)	Grass (E)	Poaceae	Whole plant	4	0.038	0.05	The grass is burned and the ashes applied for healing of sores and wound.	Grass	SGL
Pouzolzia mixta Solms Syn: *Pouzolzia huillensis* Hiern (MVS 009)	Muthanzwa (V) Snuggle-leaf (E)	Urticaceae	Roots	1	0.014	0.01	The roots are crushed to powder and applied on wound to heal it	Shrub	TMTK

Scientific names (Voucher number)	*Common name(s)	Family	Part(s) used	Frequency index	Use-value	$RFC	Method of preparation and administration	Life-form	*Location
Ricinus communis L. (MVS 016)	Nhlampfurha (X)/ mupfure (V) Castor oil plant	Euphorbiaceae	Seeds	20	0.042	0.28	The seeds are fried to take out the oil. They are then ground and put back in pan for more oil and used for moisturizing the skin and hair. The seeds are ground to take out oil.	Shrub	TKM TMTK LVB FLVD SGL
Salacia rehmannii Schinz. (MVS 026)	Phathatsimima (V)	Celastraceae	Roots	1	0.014	0.01	The roots are ground and mixed with water to wash sores	Shrub	TMTK
Sclerocarya birrea (A.Rich.) Hochst. (MVS 033)	Murula (V) Marula (E)	Anacardiaceae	Stems, Seeds	2	0.042	0.03	The stem is burned and applied on wound. The seeds are ground and mixed with water until it becomes soft to moisturize the skin and as anti-aging.	Tree	LVB FLVD
Searsia lancea (L.f.) F.A.Barkley	Mushakaladzane (V) Karee (E)	Anacardiaceae	Leaves	5	0.042	0.07	The leaves are crushed and mixed with water to clean the skin and to remove rash. The leaves are boiled in water to		LVB KKN FLVD

Scientific names (Voucher number)	*Common name(s)	Family	Part(s) used	Frequency index	Use-value	$RFC	Method of preparation and administration	Life-form	*Location
(MVS 045)							bathe with to remove pimples.		
Setaria acromelaena (Hochst.) T.Durand & Schinz (MVS 046)	Xihovane (X) Bristle Grass (E)	Poaceae	Stems	1	0.014	0.01	The stem is crushed and infused with water to remove sores	Grass	SGL
Sida cordifolia L. (MVS	Mutudo (V) Flannel Weed (E)	Malvaceae	Roots	1	0.014	0.01	The roots are burned and the ashes applied on wound to heal it.	Herb	TKM TMTK
Solanum panduraeforme E. Mey. (MVS 035)	Mututulwa (V) Apple of Sodom (E)	Solanaceae	Fruits	2	0.042	0.03	The fruit is burned and applied after incision on ringworms The liquid is applied to heal wound and remove chicken pox	Herb	TKM
02Solanum tuberosum L. (MVS 048)	Potato (E)	Solanaceae	Tuber	1	0.014	0.01	The peels of potatoes arerubbed on rash to remove it.	Herb	SGL

Scientific names (Voucher number)	*Common name(s)	Family	Part(s) used	Frequency index	Use-value	$RFC	Method of preparation and administration	Life-form	*Location
Striga asiatica (L.) Kuntze (MVS 044)	Vhuri (V) Red witchweed (E)	Orobanchaceae	Whole plant	2	0.014	0.03	The plant is burned and applied for healing of wound.	Herb	TMTK
Strychnos spinosa Lam. (MVS 023)	Muramba (V) Spiny monkey orange	Loganiaceae	Fruits	1	0.014	0.01	The liquid of fruit is applied on ringworms to remove them.	Tree	LVB FLVD
Synadenium cupulare (Boiss.) L.C. Wheeler (MVS 042)	Muswoswo (V) Crying Tree (E)	Euphorbiaceae	Stems	2	0.014	0.03	The stem is cut then liquid applied on skin moles to remove them.	Shrub	TKM
Tabernaemontana elegans Stapf (MVS 029)	Muhatu (V) Toad tree (E)	Apocynaceae	Stems, Roots	2	0.038	0.03	The stem is cut, the liquid from the stem is applied to remove ringworms. The roots are burned and ground to be applied on ringworms to remove them.	Shrub	LVB

Scientific names (Voucher number)	*Common name(s)	Family	Part(s) used	Frequency index	Use-value	$RFC	Method of preparation and administration	Life-form	*Location
Terminalia sericea Burch, ex DC (MVS 015)	Nkonono (X) / mususu (E) silver cluster-leaf (E)	Combretaceae	Roots, Leaves	3	0.038	0.04	The roots are burned andapplied on pimples to remove them. The leaves are crushed and mixed with oil to moisturize the skin.	Tree	TMTK SGL
Trichilia emetica (MVS 027)	Nkuhlu (X) Natal mahogany (E)	Meliaceae	Seeds	1	0.014	0.01	The seeds are ground to produce oil for moisturizing the skin	Tree	SGL
Vernonia fastigiata Oliv. & Hiern (MVS 021)	Tanyi (V) Narrow-leaved Vernonia (E)	Compositae/ Asteraceae	Leaves	2	0.014	0.03	The leaves are crushed and smoothly rubbed on the skin to remove wound scar	Herb	TMTK
Zanthoxylum davyi (MVS 024)	Munungu (V) Fever Tree Knobwood (E)	Rutaceae	Roots Leaves Stem	4	0.038	0.05	The roots are ground and the leaves crushed to be applied on wound to heal it. The stem is crushed to wash the teeth.	Tree	TMTK LVB

Scientific names (Voucher number)	*Common name(s)	Family	Part(s) used	Frequency index	Use-value	$RFC	Method of preparation and administration	Life-form	#Location
Zea mays L. (MVS 48)	Mufhumbu ha mavhele (V) Maize (E)	Poaceae	Fruits	12	0.038	0.16	Cob is ground and mixed with water to bathe with to remove rash. Cob is ground and applied directly to remove pimples.	Grass	TKM LVB TMTK KKN

*Common name: V = Venda, E = English, X= Xitsonga; $RFC= Relative frequency citation

#Location: TKM= Tshakuma, TMTK= Tshamutilikwa, LVB= Luvhimbi, SGL= Shigalo, KKN= Khakhanwa, FLVD= Folovhodwe

Table 4.4: Non-plant resources used as cosmeceuticals showingthe relative frequency of citation and method(s) of preparation and or administration in Vhembe district, Limpopo province, South Africa

Common name(s)	Type of natural resource	Frequency index	Use-value	$RFC	Method(s) of preparation and administration	Location(s)
Tshinyai	Soot	3	0.038	0.04	Soot is mixed with oil then applied on the skin to remove rash and stretchmark.	Tshakuma Luvhimbi Tshamutilikwa Shigalo
Luvhundi soil	Soil	17	0.042	0.23	The soil is mixed with *oil or water* and applied on feet cracks to remove them. It is also applied as sun protector. Soil is mixed with oil to remove rash.	Tshakuma Luvhimbi Khakhanwa Folovhodwe Shigalo
Mtaba (sand)	Soil	1	0.014	0.01	The soil is rubbed on the teeth and rinsed with	Tshakuma

Common name(s)	Type of natural resource	Frequency index	Use-value	[5]RFC	Method(s) of preparation and administration	Location(s)
					water to clean the teeth	
Khedi	Soil	1	0.014	0.01	Soil particles are ground to fine then applied on the face for complexion	Tshakuma
Munyaka stone	Stone	2	0.014	0.01	The stone is crushed to fine then mixed with water to rub on the skin to soften it.	Luvhimbi
Munyaka soil	Yellow and brown soil	2	0.014	0.03	The soil is applied directly on the face as a make-up foundation.	Khakhanwa
Salt Water/ sea water	Water	2	0.038	0.03	Salt and sea water is used to remove rash and ringworms.	Shigalo
Marumbuda White/green substance on stones usually after heavy rain	Fungi	1	0.042	0.01	Applied on stretchmark, ringworms and rash to remove them.	Tshakuma Folovhodwe
Green algae of river (Hololo)	Fungi	3	0.038	0.04	Hololo is burnt and mixed with leaves of musuma to remove ringworms. Algae is burnt and applied on wounds to heal them	Luvhimbi
Goat	manure	1	0.014	0.01	The manure is burnt then applied on rash to remove it	Khakhanwa
Cow dung	Manure	3	0.038	0.04	The moist manure is applied on the feet then washed with water to remove cracks. Manure is also mixed with menstruation blood to remove silver stripes.	Tshakuma
Cow milk	Milk	5	0.014	0.07	Cook the milk to make it cream out of it then apply topically on the skin to moisturize it.	Tshakuma Khakhanwa
Ngulube daka	Oil/fat	1	0.014	0.01	Pig fat is applied on the skin to moisturize.	Tshakuma
Lizard manure	Manure	1	0.014	0.01	The manure is crushed then applied directly on wound to heal it.	Tshamutilmusikwa
Stones	Stone	18	0.038	0.25	The stone is used to scrub the feet to remove cracks and remove dirt on the body.	Tshakuma Luvhimbi

Common name(s)	Type of natural resource	Frequency index	Use-value	[5]RFC	Method(s) of preparation and administration	Location(s)
						Khakhanwa Folovhodwe Shigalo
White mountain stone	Stone	5	0.038	0.07	The stone is ground into sand then rubbed on the teeth to clean and whiten them.	Tshakuma Shigalo
Mafhura tharu/ntlharo	Python fat	13	0.042	0.18	Python fat is extracted by frying the python and the oil is applied on burn skin and wound to heal them and remove scars. Makes a person live long	Tshakuma Tshamutilmusikwa Khakhanwa Folovhodwe
Nguluvhe/ Honje	Pig fat	50	0.056	0.70	The oil is extracted by cooking the meat of pig and that oil is used to moisturise and remove cracks, used as soap to soften and protect the skin.	Tshakuma Tshamutilikwa Luvhimbi Khakhanwa Shigalo Folovhodwe
Cattle fat	Cattle fat	9	0.014	0.12	The milk is fermented to make a rom, which is then boiled to make oil and is applied on the skin as moisturizer.	Tshakuma Luvhimbi Khakhanwa Tshamutilikwa Folovhodwe Shigalo
Urine	Urine	3	0.014	0.04	The urine is applied on burned skin to heal it.	Tshakuma Shigalo
Wood ashes/coal	Ashes	11	0.056	0.15	The wood coal is ground then rubbed on the teeth and rinsed with water. It is also applied around the eyes as make-up. The wood coal is ground and mixed with oil to dye and make the hair soft.	Tshakuma Luvhimbi Folovhodwe Shigalo
Sandy Soil	Soil	11	0.014	0.15	The sandy soil is rubbed on the teeth to clean them. Mix it with water and rub on the skin to remove dirt	Tshakuma Luvhimbi Folovhodwe Shigalo

[$]RFC= Relative frequency citation

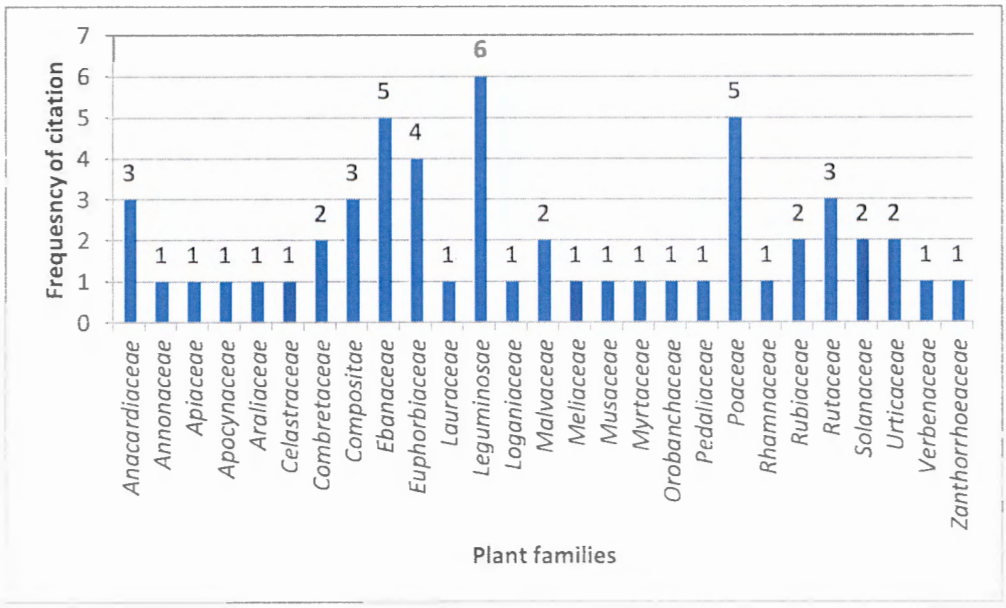

Figure 4.3: Frequency of citation of plant families mentioned in Vhembe district, Limpopo province, South Africa

4.3.2.1 The plants habit, parts used and cosmeceutical application

The identified plant species comprises trees (majorly), shrubs, grass and herbs (**Fig. 4.4**). Although different plant parts such as leaves, bark, fruits, flowers, roots, twigs and stem were used for cosmeceuticals, the leaves (31%), fruits (18%) and roots (13%) were the most utilized parts (**Fig. 4.5**). The natural resources used for folk cosmeceuticals are administered as powder, poultice, juice, infusion and by washing of wound. The remedies were administered as a treatment for skin afflictions, cosmetics, anti-oxidants and hair care (**Table 4.6**). Most (88%) of the remedies were applied topically.

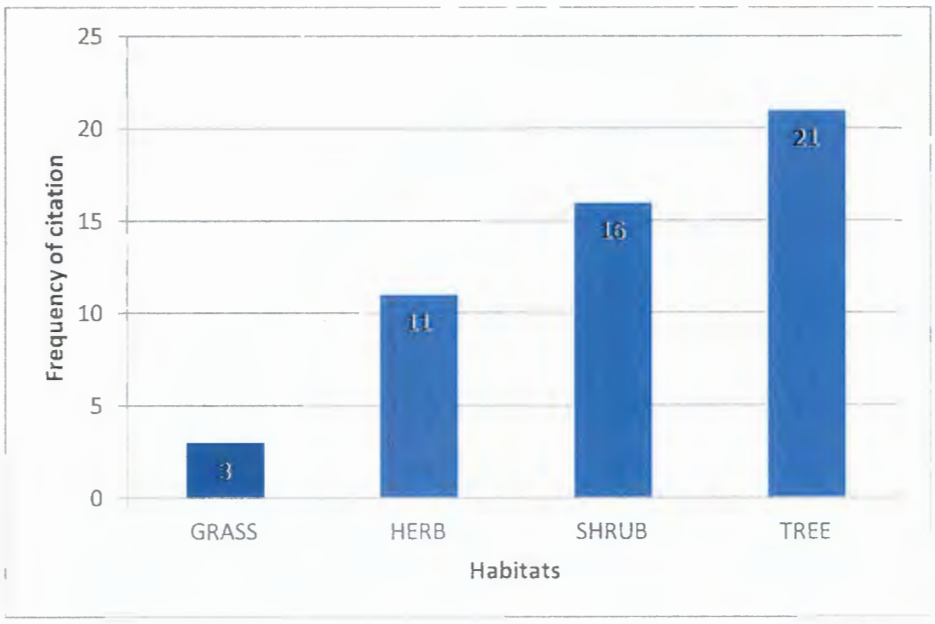

Figure 4.4: Frequency of citation of habitats in Vhembe district, Limpopo province, South Africa

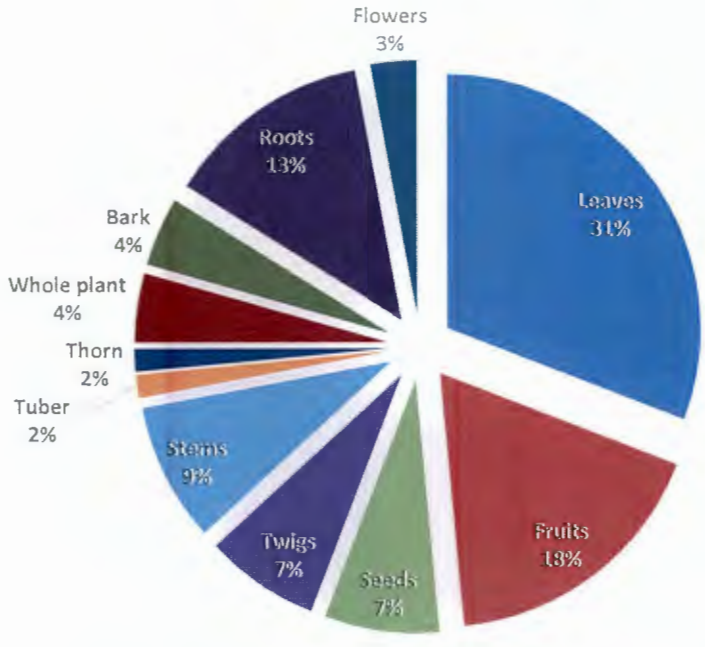

Figure 4.5: Distribution (%) of plant parts for preparation of remedies used as cosmeceuticals among rural communities in Vhembe district, Limpopo province, South Africa

Table 4.5: Frequency of citation of the natural resources used for variety of skin problems in Vhembe district,Limpopo province, South Africa

Cosmeceutical category	Cosmeceutical use	Number of natural resources used
Skin afflictions	Wound	27
	Burn	7
	Ringworms	12
	Moles	2
	Pimples	8
	Chicken pox	1
	Rush	13
	Cracks on feet	6
	Stretch marks	4
	Skin irritation	3
	Scar removers	2
	Soars	12
Cosmetic uses	Teeth hygiene	11
	Soaps	6
	facial scrubs and mask	3
	Body creams	16
Hair care	Shampoo and dye	6
Anti-oxidants	Protect skin	3
	Removes wrinkles	1
	Soften skin	6

4.4 Discussion

The current ethnopharmacognostic survey indicated that the custodian of knowledge on natural resources with cosmeceutical potential were females and elders (above 70 years). Many ethnopharmacognostic studies indicated that the ethnopharmacological knowledge is disappearing because it is held by the elders. Ethnopharmacognostic knowledge is transmitted orally from generation to generation

but its practice seems to be declining due to the lack of interest by the youth (Motlhanka and Nthoiwa, 2013).

4.4.1 Knowledge on natural resources used for folk cosmeceuticals

The high quantity of natural resources, especially regarding the diversity of flora identified, is an indication that the study area has rich indigenous knowledge on folk cosmeceuticals. According to Fongnzossie et al. (2017), there is a lack of documentation of the ethnobotanical knowledge concerning cosmeceuticals. Furthermore, Lall and Kishore (2014) highlighted the existing research gaps that involve both the inadequacies in ethnobotanical documentation and scientific evaluation of the plants. The cosmeceutical and aesthetic value recorded in the field of study comprises the treatment for skin affliction (wound, burn, ringworms and moles), cosmetics use (teeth cleaners, soaps and moisturizers), hair care (shampoo and dye), and aromatic and perfuming.

The knowledge received expresses a bit of variety in the natural resources known to the communities because Vhembe district has different ethnic groups. The cultural differences found among these ethnic groups could be attributed to the variation in ethnobotanical knowledge. In relation with the cultural theory of the study, the results indicated the different ways those ethnic groups construct knowledge, because cultures provide diverse ways of interpreting the environment. The diversity of cultures and beliefs influences the variety of indigenous knowledge and practices (Gebashe et al., 2018). Conversely, there is no ethnic group which can treat all its historical and cultural aspects or elements as entities that identify them because some of these elements are the same with the other ethnic groups (Eller, 1997). Therefore, the study unravelled few plants and non-plant materials that are known only in certain ethnic groups. Indigenous knowledge is influenced by the type of natural resources in an area hence communities in Vhembe share similar knowledge. Cultural diversity and rich flora are indicators of the existence of rich ethnobotanical knowledge (Yeşilada, 2002) According to Mabogo (1990), the high diversity of species and endemism inspires the traditional plant use and plant-related practices in Vhembe district.

As an addition to existing survey in Vhembe district (Mahwasane et al., 2013; Mabogo, 1990; Constant and Tshisikhawe, 2018; Magwede et al., 2018; Mongalo and Makhafola, 2018; Arnold and Gulumian, 1984), the current study documented new plants (for e.g.*Eugenia natalitia, Salacia rehmannii)* for the first time as folk cosmeceuticals. Most of the plants are documented as medicine without the specification of the diseases they treat in the study of Magwede et al. (2018). The current study indicated that the natural resources used to treat the same skin problem differ among the communities. It was also evident that a single plant is utilised for more than one skin problem; and a single skin problem has more than one natural resource as remedies.

The results indicated that the following plants are commonly used in almost all of the communities that the study was conducted: *Dicerocaryum zanguebarium* (Museto), *Ricinus communis* (Nhlampfurha/mupfure), *Zea mays (*mavhele), *Euclea divinorum* Hiern (Nhlangula/mutangule) and *Diospyros mespiliformis* (Musuma). In relation with the consumer cultural theory, which focuses on experiential and socio-cultural dimensions, the results show the socio-culture by indicating the shared knowledge among communities in Vhembe district. That is to say, those cultures are interrelated conferring to ethnographic theory. Other authors have recorded those commonly used plants, which is an indication of their cosmeceutical value. For instance, Chigora et al. (2007) stated that the whole plant of *Dicerocaryum zanguebarium* (Museto) is used to make foam which is inserted into vagina to dilate birth canal in Zimbabwe. The juice from the plant is also used as shampoo by people of Gazankulu in Limpopo province (Liengme, 1981). The current study affirmed the use of *Dicerocaryum zanguebarium,* as the participants indicated the use of the whole plant to wash their hair. The study of Fongnzossie et al. (2018) shows that *Zea mays* is used for skincare. The authors also asserted that *Zea mays* has therapeutic and cosmetic value; for it is used as skin protectant, anti-inflammatory and reduces loose teeth, mitigates gum swelling and for its skin regenerative properties.

Many surveys have identified and documented *Ricinus communis,* which suggest that the plant has high medicinal and cosmeceutical values (Abbasi et al., 2010;

Ilavarasan et al., 2006; Scarpa and Guerci, 1982; Jena and Gupta, 2012). According to Maroyi (2011), the roots of *Ricinus communis* are used indigenously to clean the teeth and also to heal toothache. The seeds are used as oil, which is applied on sore eyes in Zimbabwe. The leaves are burned, seeds and bark are pulverized and applied as poultices to relieve soreness and inflammation (Mabona and Van Vuuren, 2013). Similarly, the leaves mixed with water to wash and cure boils on the skin by the Xhosa people in Eastern Cape, South Africa (Bhat, 2014). The different plant parts used from the same plant for different cosmeceutical purposes is an evidence of the variety of indigenous knowledge possessed among different communities and ethnic groups.

The commonly used non-plant resources included wood ashes, pig fat, stones, ochre (Luvhundi soil) and soot (Tshinyae). Ochre is commonly used in initiation schools in South Africa as earlier mentioned. The participants stated that they use it for skin protection from the sun and insect bites. The cosmeceutical value of ochre has been recorded in other studies (Molefe, 2015; Morekhure-Mphahlele et al., 2015). According to Volpato et al. (2012), Sahrawi refugees in Western Sahara apply red ochre around their eyes to reduce solar radiance. The participants mentioned that the wood ashes are utilized to dye hair and make hair soft, darken their eyebrows as make-up, and for teeth whitening. As part of the remedies for healing skin diseases in the inland Marches of Central-Eastern Italy, Pieroni et al.(2004) indicated that the mixture of ashes and water softens the hair. As indicated by Zhang et al. (2018), the people of Bulang, China used soot to blacken their teeth to ensure the health of the teeth.

4.4.2 Plant families, plant-habit and plant parts

From the current study, the documented plants belong to 27 families and the dominant family was Leguminosae/Fabaceae. As recorded in the current study, the Leguminosae/Fabaceae was also the most dominant family among the study areas in South West, Nigeria (Fred-Jaiyesimi et al., 2015) which was in line with the findings from this study. Although, on the other hand, Afolayan et al. (2014) indicated that Leguminosae/Fabaceae is the third most common family after Solanaceae and

Asteraceae as plant families used by the Xhosas for skin diseases. Generally, the Leguminosae/Fabaceae is considered to be one of the families that have economic and medicinal value (Kuete et al., 2013).The plant habit that dominated the survey was trees and that most of the remedies were prepared using the leaves. Similar high utilization of the leaves was recorded as folklore phytocosmetics among the communities of South West, Nigeria (Fred-Jaiyesimi et al., 2015). The use of leaves for folk cosmeceutical emboldens conservation, unlike using roots and bark. According to Mathabe et al. (2006), remedies were commonly prepared from bark collected at anytime and though in some instances some plants were not collected because the formulation require the use of the roots, which could suggest possible death of the plant should the roots be collected. Most of the time, active ingredients are not present in equal amounts in all parts of a plant and thus, usually only one part of the plant is used (Muda et al., 2017).

4.4.3 Cosmeceutical applications, method of preparation and administration

Dermatological problems occur on every individual despite the age, gender or social status. The study indicates that there could be more than one plant adopted to treat the same skin problem. The highest cosmeceutical application mentioned by the participants was wound (27) followed by body creams (16) **(Table 4.5)**. The health 24 (2017) in an article about the 10 most common skin concerns for South African women, included wrinkles, moles, stretch marks and adult acne in the list (*https://www.health24.com/Lifestyle/Beyond-beauty/sa-womens-most-common-skin-concerns-20170810*) and the current study reveals the natural resources that have potential to be used as remedies for some of the skin problems mentioned above. It is an indication that the ethnopharmacological information is a valuable source to commercialise cosmeceutical products (Güzel et al., 2015).

The natural resources are prepared as single or in combination with other natural resources. The study shows that both plants and non-plants are mostly mixed with water and oil to enhance penetration into the skin. The non-plant materials such as menstrual discharge, urine and cow dung are mixed with the other plant materials to potentiate its effect (Arnold and Gulumian, 1984). Crushing is a dominant

preparation method and the remedies are mostly applied topically as paste directly on the skin problem. The literature about the medicinal plants used for skin problems indicates that the method of administration includes powder, paste, plant juice, ointment, poultice, leaf extract and infusion (Afolayan et al., 2014; Omwenga et al. 2015; Abbasi et al., 2010; Agyare et al., 2009). The findings of these aforementioned studies indicated that the majority of administration methods are similar to the current study. Mongalo and Makhafola (2018) investigated the ethnobotanical knowledge of lay people in Blouberg (Pedi tribe), Limpopo and indicated that the medicinal plants are applied topically on the skin while others are used to wash and rinse the infected parts of the body.

4.4.4. Use-value of plant species

The findings from the study indicated that some resources that have high use-value are also commonly used by the communities of area of study, and they include *Euclea divinorum* wood ashes, pig fat, and ochre. *Aloe barbadensis* is an ancient medicinal plant used externally for different skin problems around the world. In the current study, the gel of the plant is used to moisturize the skin, remove stretch marks, ringworms and rash; and to heal burned skin as well as wounds. Likewise in India, Rajeswari et al. (2012) indicated that *Aloe barbadensis* is a miracle plant that has many different cosmeceutical uses (to heal cuts, burns, eczema, inflammation, sunburns and as hair styling gel). Furthermore, *Aloe barbadensis* is used in many natural products for the skin which include make-up, moisturizers, soaps, sunscreens, shampoos and lotions (Rajeswari et al., 2012) . *Aloe barbadensis* action consists of seamless and coordinated cascade of cellular and molecular events that interact with re-epithelialization and reconstitution processes of the tissue to ensure wound healing (Rodrigues et al., 2018). As reviewed by Amoo et al. (2014), Aloe species, including *barbadensis,* are used for laxatives and for skin ailments because they exert pharmacological properties such as antimicrobial, anti-inflammatory, anti-plasmodial and anthelmintic.

Euclea divinorum is traditional medicine used for several ailments, including skin disease. Current findings also indicate that the plant removes skin irritation,

ringworms, rash, pimples and chicken pox. Woldemedhin et al. (2017) affirmed the healing property of *Euclea divinorum* by revealing its usefulness against skin ailments such as inflammation of the skin, eczema and scabies in Ethiopia. The study of Otang and Afolayan (2016) indicated the therapeutic value of *Citrus limon* on the skin. *Citrus limon* is used to reduce skin itching, for skin nourishment, and the pulp left after extraction of the juice is reported to be used for the treatment of pimples and wrinkles and to soften facial skin (Otang et al., 2015). Similar uses were also recorded in the current study whereby the participants indicated that *Citrus limon* is used for moisturizing, removing wrinkles, scars and pimples in the study area. Furthermore, Otang and Afolayan (2016) demonstrated that *Citrus limon* has high anti-microbial and antioxidant which are effective to treat skin ailments.

4.5. Concluding remarks

The study was undertaken to identify the natural resources used as folk cosmeceuticals in Vhembe district for future investigation and for solutions to dermatological problems. In total, 54 plant and 21 non-plant materials were recorded as folk cosmeceuticals. The great number of natural resources documented was an indication that the area of study is rich in ethnopharmacological knowledge concerning the folk cosmeceuticals. The concoction from more than one plant or/and in combination with other natural resources used for skin problems should be thoroughly validated scientifically is similar manner the single plant (in most studies) is validated. The scientific validation should not only be about the efficacy but also about the toxicity of the natural resources as this will provide the insight and understanding of the ethnopharmacological knowledge regarding folk cosmeceutical, which may ultimately lead to the innovations of skin products that can be commercialized. As commonly observed with many ethnobotanical surveys, most of participants were elders. This is an indication that a great deal of effort is needed to document this kind of knowledge, not for only young people, but also for elders of at least below 50 years who do not possess it. Above all, it should be noted that the issue of documenting this knowledge without allowing it to go into extinction calls for a great concern, requiring urgent prerequisite for primary research on this subject of folk cosmeceuticals aside the increasing demand or market for natural skin products.

The documentation of ethnopharmacological knowledge will contribute to preserving these valuable natural resources.

CHAPTER 5: INDIGENOUS KNOWLEDGE AND PRACTICES ON FOLK COSMECEUTICALS AMONG COMMUNITIES IN VHEMBE DISTRICT

5.1 Introduction

The understanding of indigenous people concerning health is different from the western one because of the different worldviews. Hence, African traditional belief systems in public healthcare tends to be neglected by individuals, government and development agencies (Kaya, 2007). White (2015) described the African religious' view regarding disease, causes of disease, diagnosis of diseases and treatment. In an African, health is not just about the proper functioning of bodily organs. Good health for the African consists of mental, physical, spiritual and emotional stability of oneself, family members and community. This is an indication of health is based on the African unitary view of reality (White, 2015).

Karimi et al. (2015) support that herbal therapy is holistic, integrating the emotional, spiritual and mental well-being of the patients. The beliefs involved in indigenous health system is often overlooked or considered to be superstitious because beliefs do not convey scientific facts but shape the thinking and behaviour of an individual (Kaya, 2007). According to Rankoana et al. (2015), some of the indigenous aetiology of disease are ancestral spirits, witches and sorcerers. Shenefelt and Shenefelt (2014) affirmed that since ancient times, the skin disorders have had the spiritual and religious aspects.

There are several ways Africans explain and understand the causes of diseases, including the skin diseases. For instance, evil spirit and disobedience to ancestors are believed to cause diseases (White, 2015; Workneh et al., 2018). Good health is usually understood in terms of the relationship with one's ancestors and as results of good behaviour if one lives in accordance with the values and norms of the traditions of community (White, 2015). Quave et al. (2008) affirmed that if diseases are observed as superstitious or spiritualistic, they are treated differently. Some of the manifestations of skin inflammation are believed to be caused by wind illness or dead fire illness which requires the performance of rituals accompanied with natural resources (Quave et al., 2008). Hence, Reyes-García (2010) asserted that the choice of treatment is often time explained through the understanding of the cause in

African indigenous health system. The African indigenous healing system is addressed via two perspectives which are the spiritual and physical perspectives (White, 2015). The ethnomedicine practices form the basis of indigenous healthcare (Rankoana et al., 2015).

In Africa, there is enormous interest in medicinal plants, and some harvest them for commercial purposes to improve their livelihood. Intensive harvesting of wild medicinal plants is a serious threat to biodiversity for over 700 plant species actively traded in South Africa (Mander, 1998). Commercialization of medicinal plants aggravate the difficulty in managing the harvest of medicinal plants (Botha et al., 2004). The decline in medicinal plants results in significant economic and welfare losses, considering there are millions of people who are consumers of *Muthi* in South Africa. One of the reasons they utilise the medicinal plants is because they are affordable. The study of Mathibela et al. (2015) indicated that majority of traditional practitioners do not utilize the apprentices for collecting plant materials, because they believe that they are familiar with the area and they know how to perform the necessary harvesting rituals. Furthermore, the study indicates that the very same traditional practitioners realised that there is a change for worse of the vegetation in the mountain in their area. The South African legislation has failed the restriction of illegal medicinal trade and also the ignorance of customary rules such as of rituals, taboos; period of harvesting concerning the traditional medicine has led to overexploiting of medicinal plants (Botha et al., 2004).

There is a need to understand the subjective meanings and philosophies behind the social actions of indigenous peoples. Ethnopharmacology generally seeks to understand the traditional uses of natural resources for pharmaceutical value. Moreover, it searches for the unique pharmacological philosophies from the remedies. Most of the studies conducted in ethnopharmacology lack this latter aspect as they mostly compile an inventory of traditional medicines and their uses. Negi et al. (2010) stated that there is a need to support, safeguard and promote cultural and spiritual philosophies of traditional medicine. Hence, this study focused on the indigenous knowledge and practices involved in preparation and use of folk cosmeceuticals among communities in Vhembe district. Practices in the context of the study refer to application of ideas, values, belief and customs relating to folk cosmeceuticals.

5.2 Methodology

The methodology of the study was presented in **Chapter 4 (4.2)**. The questionnaire used to collect data had both closed-ended and open-ended questions. For the current chapter, the open-ended questions were used for data collection. The observation tool was used for this chapter, whereby the researcher was observing how folk cosmeceuticals are prepared, harvested and preserved. The pictures were taken in the process.

5.2.1 Data analysis

Thematic analysis was used to analyse the open-ended questions generated from the questionnaire. The researcher first became familiar with the data by reading and re-reading the transcript. Thereafter, the data was organized in a meaningful and systematic manner. This was determined by the research question, in which the researcher recorded data in segments relevant to the study. Moreover, the researcher examined the codes and some fitted well together into the theme. Thereafter, the researcher collected codes to fit in different relevant themes. Subsequently, the responses were described in a meaningful manner.

5.3 Results

5.3.1 Harvesting of plants used for folk cosmeceuticals

Participants mentioned that, initially the VhaVenda traditional practitioners were not supposed to collect traditional medicine and remain with them in the house; instead, they would diagnose the people and request them to return the following day to collect the traditional medicine to treat what was diagnosed. One of the practices in collecting medicinal plants among the Vendas is that they will not collect in August because of the assumption that most of the plants are dried during the winter (dry) season. This practice is a technique used to prevent the plants from dying after collection. During the collection of roots, the participants would cut the horizontal root of a tree and cover uncut roots with soil to prevent it from dying. Furthermore, the participants do not collect medicinal plants from the north and south sides: the collection of medicinal plants was related to the sun direction. According to the participants, medicinal plants harvested from the east side is for people who are

below 50 because they still need to shine because the sun rises from the east side. On the other hand, collection of medicinal plants from the west side are for people that are older than 50 years because they are about to leave the earth. Generally, south and north sides are viewed as bad omen in Venda culture.

Participants believed that when they have collected a plant and it happens that it dies, the medicine from that plant would not be effective. The patient cannot be healed with a plant that has already died because it is seen as a curse. The ancestors may cause the death of the plant if practitioner does not follow the instructions given by ancestors. Often, the ancestors guide the practitioner to where to find medicinal plant(s). In some cases, the ancestors lead the traditional practitioner to a specific plant among the similar population of plants.

There are taboos that guide the harvesting; for instance, there are plant materials collected only when one is naked and only elders collect the other ones. The one collected by elders have the ability to make one infertile.

The participants did not mention anything about the harvesting of other natural resources, because they mainly use the plant material for skin and the customary laws are mostly based on plants.

5.3.2 Preparation of folk cosmeceuticals

In the current study, the natural resources were prepared either using a single or mixture of natural resources. The natural resources were mainly combined with water and oil to enhance penetration when applied on the skin. In some cases, different methods are applied to prepare the same plant. In addition, the knowledge of preparation is particularly based on the plant parts that are used and the culture of an individual. *Xanthoxylum davyi* (mununguu) is an example of a plant that is prepared using more than one method. While the roots are ground, leaves are crushed for wound healing. Some of the practices involved in preparation of the folk cosmeceuticals require that elders should prepare the plants (e.g. *Ricinus communis*) for the remedy because they had knowledge about the times and way in which it should be prepared.

In this study, several methods were used to prepare the natural resources for folk cosmeceuticals in Vhembe district **(Fig. 5.1)**. The natural resources used for folk cosmeceuticals are preparation by infusion, powder, juice, grinding and maceration. Mostly, the natural resources are prepared by crushing (25) and the least common method is maceration (3).

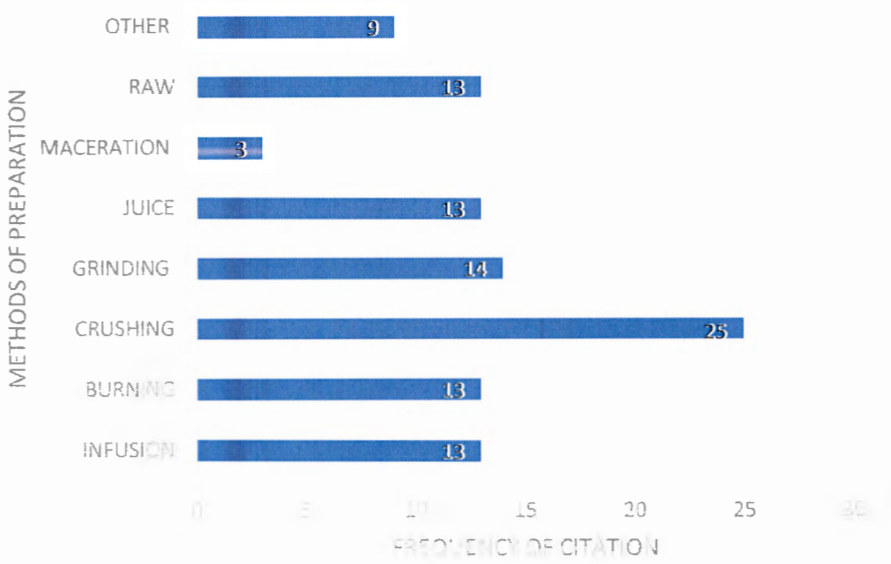

Figure 5.1: Frequency of citation for preparing natural resources used as cosmeceuticals among communities in Vhembe district, Limpopo province, South Africa

The descriptions of the preparation methods recorded in the study are highlighted below.

a. *Crushing*

Generally used for both dried and fresh natural resources, especially plants. The method removes liquid substance from the leaves, stems and twig. The dried leaves, barks, roots, stone and soil are crushed to make powder **(Fig. 5.2)**.

Figure 5.2: Example of crushing as a preparation method. A = stone and B = a participant crushing a natural product

b. Grinding

This method is similar to crushing but the difference is when bark and root is ground, it becomes large particles that are infused in water to wash wound. For instance, the roots of *Jatropha curcas* are grounded and infused in water to wash wound.

c. Burning

The dried plant parts are burnt and crushed following application on the skin. The natural resources are burnt into ashes or soot. The study indicates that the fruit of *Solanum panduraeforme*is burnt and the ashes are applied on incision and ringworms.

d. Infusion

The ground plant parts especially bark and roots are added into either cold or hot water for a specific period depending on plants to extract the active ingredient that treats skin ailments. For instance, the cob of *Zea mays* is ground and infused in water to wash rush.

e. Maceration

This method is similar to infusion as the plant parts are ground and are soaked in water for a longer period relative to infusion. For example, the roots of *Eugenia natalitia* are soaked in water to extract for treating wounds.

f. Juice/gel

The plant parts are cut to remove the juice that is used to treat the skin ailment. The parts mostly used are fruits, leaves and stems. In the current study, the leaves of *Aloe barbadensis* are cut and the gel applied on skin to treat ringworm, moisturize the skin, remove stretch marks, rash and to heal burnt skin and wounds..

g. Raw

The current findings indicate that some of the natural resources such as seawater, stones, soil, urine, cow dung, algae, tshinyae (soot) and luvhundi (ochre) are not prepared. However, some of them are mixed with other natural resources for treating different skin ailments. For instance, cow dung is mixed with menstrual discharge to remove the stretch marks.

h. Other

The participants also reported other methods such as frying, boiling and fermentation. In some instances, the participants remove oil from animals by boiling or frying it. The fermented milk of cow was cooked to moisturize the skin. The seeds of *Ricinus communis*are fried and ground to produce oil.

5.3.3 Utilization of folk cosmeceuticals

The effectiveness of folk cosmeceuticals in Vhembe district is determined by the method of harvesting, dosage of folk cosmeceuticals, and adherenceto instruction from the traditional practitioner.

5.3.3.1 Dosage of folk cosmeceuticals

With regard to the dosage of folk cosmeceuticals, the participants asserted that the traditional practitioner initially gives smaller dosages to customers to observe if s/he reacts to it. Thereafter, customers give feedback to traditional practitioners on the effect of the medicine given and this would inform whether an alternative medicine would be given or otherwise. Participants stated that the dosage of the folk cosmeceuticals is determined by age and type of skin diseases. For instance, the dosage given to the person with rash that covered body and the dosage given person who has wound vary. In most cases, children receive smaller dosage, whereas elders are given greater dosage.

5.3.3.2 Administration of folk cosmeceuticals

The participants stated that to beautify and restore the functions of the skin is not only dependent on applying the cosmeceuticals topically, because some preparation may be orally administered. For instance, *Sclerocarya birrea* (marula) beverage makes the skin to glow by removing the toxins from the body. The fruit of Marula (*Sclerocarya birrea*) is not only used for beverage but the seeds are processed to make oil that is applied to make the skin glow. *Khuarambela* is a practice whereby certain stone is placed in hot water to steam the body and in the process remove toxins from the skin, and traditional practitioners perform it in different ways depending on how they have been trained. The participants mentioned that it is a taboo to practice medicine if one just returned from ceremonies such as funerals. This is because of the belief that evil spirits might have attached themselves on the traditional practitioner; hence, s/he has to sanctify him/herself first before practicing or helping a patient.

5.3.3.3 Rituals involved in utilizing folk cosmeceuticals

The participants reported that there are skin diseases that are superstitious because of their causes. Some skin diseases are caused for disobeying the ancestors, misbehaving in a community or because of evil spell. Rituals are mostly performed on the skin that could not be healed or treated by applying folk cosmeceuticals. *Gumululo* is a ritual used to remove sores on skin and traditional doctors perform it. Traditional practitioners wash the sores using water mixed with unspecified concoction. Some severe skin diseases require one to stay in an isolated area for treatment. The process of healing then requires that elders and traditional practitioners treat patient by sprinkling water mixed with the unspecified concoction. Patient will be treated there and after certain period when the patient returns, the family members will be given the concoction to prevent the same disease. In some instance, patients wash themselves in a lake called '*Dzivha la fundudzi*' in Venda because it is a sacred river, a river of gods. For them to access the lake, they firstly request the priest and traditional practitioner that guard the lake to wash away the disease.

In Tsonga culture, when one inherits a name and it happens that s/he has sores that cannot be healed when treated normally; the traditional practitioner applies soil on the body of that person by *Sclerocarya birrea* tree (marula) and then asks the person

whom s/he has inherited the name from to remove the sores. They carry snuff and traditional beer along with a concoction of soil mixed with unspecified medicinal plant that will be applied on the sores. Snuff and traditional beer is used to appease ancestors and the owner of name. A name is inherited with the character and every good and bad habits of the previous bearer of such name. After the application of the concoction of soil and medicinal plant, the traditional practitioner breaks the container that had concoction. The next day, the traditional practitioner takes patient to the same tree and washes that person and the sores will go away.

In some cases, the patient will be taken to a crossroad and the traditional practitioner will apply *Euclea divinorum* (Nhlangula) mixed with tsimba in container called ndengo then breaks it after. On the following day, the traditional practitioner takes the patient to the same spot that they broke the container and washes the patient with water in order to heal the sores. On other hand, some participants stated that if a child has rash, they wash the child with *Searsia lancea* (mushakaladzane) and then go to crossroads where the ochre (luvhundi) will be applied to eliminate the rash.

According to some participants, some of the skin diseases are symptoms of other diseases. As a result, rituals are performed for the main disease. The traditional practitioner would instruct the patient on how to treat the main disease. Therefore, when the actual disease is treated by performing ritual the skin will be healed eventually.

Furthermore, the irritation on the skin is stopped by making incision on skin and applying concoction. To remove chicken pox, participants take clay pot, stand in the middle of a kitchen and say "*mawi mawi shavhela kule"* which means "spell flee and go far" and it will leave. To control chicken pox, one should not sleep looking upward, for it will affect eyes. To remove moles, they will wait for lightning, and then brush away moles with grass broom. Some people cut moles and put soil in wound.

5.3.4. Factors influencing the use of folk cosmeceuticals in Vhembe district

In the current study, the participants identified different factors that influence the utilization of folk cosmeceuticals. Details of these factors are highlighted below.

5.3.4.1 Availability, accessibility and effectiveness of folk cosmeceuticals

The availability of natural resources influences the use of folk cosmeceuticals. Participants stated that availability of the natural resources depends on the season. The participants also mentioned that elders are the ones that usually make the natural resources easily accessible to young people.

Participants mentioned that witnessing folk cosmeceuticals work for other people in the society influences their use. Folk cosmeceuticals restore the functions of the skin quickly. For example, when they apply *Aloe barbadensis* (tshikopa) on wound, it takes a short time to alleviate the pain and heal the wound.

5.3.4.2 Acceptance and cultural value

The participants stated that the knowledge about folk cosmeceuticals comes from the ancestors hence they find it necessary to apply it and if not, they will lose their culture and which ultimately will dishonour their ancestors. Furthermore, they mentioned that traditional practitioners use folk cosmeceuticals to honour and obey ancestors. The participants consult traditional practitioners or use folk cosmeceuticals before using the western medicine or consulting western practitioners. Some skin diseases cannot be healed by applying cosmeceuticals, therefore they use the folk cosmeceuticals because some folk cosmeceuticals have spiritual intervention that ensures effectiveness. Folk cosmeceuticals work for those who believe in them and follow the instruction of traditional practitioners.

Inasmuch as there is diversity in cultures, folk cosmeceuticals also vary and are influenced by the culture. For instance, the Tsongas believe that wood coal that comes from initiation school can heal sores, because initiation schools are known to be sacred places. People from the community often request coals from people who qualify to enter into initiation school such as those who work there and who are initiated. This cultural value is not shared by the Vendas.

5.3.4.3 Factors that mitigate the use folk cosmeceuticals

Some of the community members neglect folk cosmeceuticals because they viewed it to be unhygienic and clashing with their faith. For example, participant 7 stated that

"*if one can take a plastic of medicinal plant to a charismatic church and it mistakenly falls, people sitting next to that individual will awkwardly look at that individual, but if the container of western medicine mistakenly falls, they will even assist to pick it up*".

Moreover, some young people do not want to use the folk cosmeceuticals no matter how hard the elders try to pass the knowledge to them. Often, it is difficult to impart the knowledge about skin problems to the youth because of their disbelief and denial of cultural things. They cannot even control them on some other cultural things because they consider them outdated. Most young generation trusts, prefers and solely relies on western cosmeceuticals.

5.3.5 Indigenous techniques used to sustain the availability of folk cosmeceuticals.

As illustrated in **Fig. 5.3** the techniques used by communities of Vhembe can be categorized into three, namely: storage (tshitemba, tshibvuvhelo and bottles), collection of the natural resources and others (i.e. techniques that are neither for storage or collection). Most of the participants mentioned that they only collected the part of a plant needed (10), followed by those who claimed that the resources were always available (9) from the wild or their garden. Some of the participants (4) mentioned that they cultivate the plants in their garden.

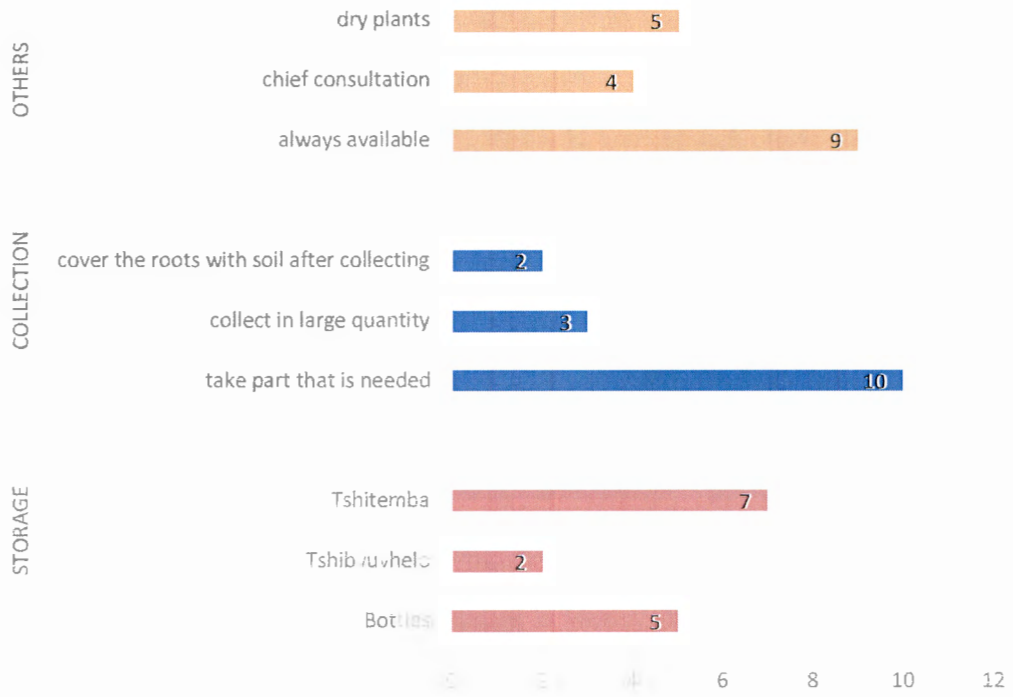

Figure 5.3: Indigenous techniques used for conservation of natural resources used as cosmeceuticals among communities in Vhembe district, Limpopo province, South Africa

The chief is consulted before harvesting medicinal plants to avoid overexploiting. The community, especially traditional practitioners, would harvest large quantity of the medicinal plants and store them in their home. Therefore, consulting the chief made it easy to conserve the medicinal plants because traditional leader would measure the quantity of medicinal plants that each person harvested. The participants mentioned that the storage areas were used to store end products such as oil made from *Ricinus communis*, powders made from natural resources, and other natural resources such as seawater/salted water. The medicinal plants are dried (**Fig. 5.4**) before they can be crushed so that they can stay longer and be available when needed.

Figure 5.4: Sun-drying of medicinal plants as a form of preservation.

5.4 Discussion

5.4.1 Indigenous knowledge and practices for harvesting, preparing and utilization of folk cosmeceuticals

The practices and indigenous knowledge engaged in folk cosmeceuticals are applied to ensure the effectiveness. Every activity involved in folk cosmeceuticals matters, commencing from the environment it was collected to the administration or application. According to the findings by Mabogo (1990), medicinal plants collected in the yard of traditional doctors might not be effective because it would have been affected by other mixed magical concoctions (*Phamba*). Mongalo and Makhafola (2018) stated that Bapedi people in Blouberg area domesticate the plants they use often than others because of a gradually declining natural environment. Deforestation affects the collection of medicinal plants in the wild. Amujoyegbe et al. (2012) indicated that the difficulties people come across when collecting medicinal plants from the wild necessitates the domestication of medicinal plants.

In Venda culture, there are medicinal plants that are harvested at certain periods. Most of plants are not harvested during the month of August (Mabogo, 1990). Furthermore, the root is a part of the plant that is believed to have the most potent healing power (Magoro et al., 2010). The participants indicated that one has to refill the soil after harvesting underground parts because the re-filling of the soil have an impact on the effectiveness of harvested plant parts; for instance if one does not refill soil, it either it worsen a patient's illness or affect the healing progress of a patient (Semenya and Potgieter, 2014). On the contrary, Magoro et al. (2010) indicated that the filling-up of soil after harvesting the roots may worsen the illness of patient; therefore, the pit will close itself during the rainy seasons. This is an indication of the different beliefs among ethnic groups that utilize medicinal plants.

The indigenous methods of preparation and administration depend on the plant used, plant parts and skin diseases to be treated. Some methods are simple while others are complex as influenced by the culture, religion and superstitious practices (Mabogo, 1990). Rankoana et al. (2015) reported that diseases could be prevented by sacrificing and observing the taboos, which might be the cause of the skin disease. The rituals are an indication of the holistic nature of folk cosmeceuticals, because many traditional African communities are of the view that certain illnesses which resist synthetic treatment can be transmitted through witchcraft and unforeseen forces that need the intervention of ancestors and God (White, 2015). The present study reveals that a higher number of preparation methods involve crushing. The study also reveals that most participants use only one natural resource to treat skin ailments, even though they prepare them differently. These aforementioned findings are similar to the observations in other studies (Demie et al., 2018; Abbasi et al., 2010; Afolayan et al., 2014; Mowobi et al., 2016). Given that some skin diseases need to be treated from within, some cosmeceutical preparations are taken orally. Based on the findings by Abbasi et al. (2010), topical application of medicinal plants was the most used method of administration while concoctions, powders, extracts and juices orally taken were for other skin conditions.

5.4.2 Factors influencing the use of folk cosmeceuticals in Vhembe district

The climate and substrate are the most important abiotic factors that determine the plants availability and accessibility for medicinal use (Akerreta et al., 2007) .The findings from the current study reveal that the availability, accessibility and effectiveness of the natural resources is one of the factors that influence the use of folk cosmeceuticals. Karimi et al. (2015) stated that people use herbal therapy because plant species are abundant in their surrounding environment. Mahomoodally (2013) affirmed that medicinal plants are the most easily accessible health resource available to the communities in many parts of Africa. This indicates the relationship that the indigenous people had with nature; for some of ethnobotanical knowledge they used for cosmeceuticals was derived by observing their surroundings.

The generational adaptation and use of indigenous knowledge are greatly influenced by culture (Senanayake, 2006). The other factor that influences the use of folk cosmeceuticals is the acceptance and cultural value that they have. Similarly, to the consumer cultural theory, it addresses the relationship between consumer (user) and the cultural meaning, therefore the study results indicate that the value that people have on culture influences them to utilize folk cosmeceuticals. Akerreta et al. (2007) indicated that certain plants are used because cultural isolation and old cultural traditions are crucial factors that influence the use of them. As highlighted by Karimi et al. (2015), traditional medicine is culturally acceptable and there is a belief that it treats several infections including the skin ailments. The respect for ancestors is one of the reasons for using folk cosmeceuticals. The result relates to the consumer culture theory in a manner that the participants still hold on to the knowledge passed down by their ancestors, which is their root. The consumer cultural theory investigates focuses on the historical roots through the experiential, social, and cultural dimensions of consumers (users) of folk cosmeceuticals.

5.4.3 Factors mitigating the use of folk cosmeceuticals

Generally, factors such as media, family, friends/colleagues, cultural beliefs, cost and level of education negatively affect the utilization of herbal medicine among communities in Imo state, Nigeria (Opara, 2016). Likewise, in the current study, religion and disbelief negatively affect the use of folk cosmeceutical among communities in Vhembe district. To corroborate the previous submission, White

(2015) stated that it is difficult for Christians to access the services of traditional practitioner because some of traditional practitioners depend on divination. The future of cultural heritage which includes ethnobotany is in danger of being lost given that the young generation neglects it due to the increasing acculturation and modern education (Weldegerima, 2009). This poses a threat to the valuable ethnopharmacological knowledge that has potential to provide solutions for diseases.

5.4.4 Indigenous conservation of folk cosmeceuticals

In the current study, the dominant strategy used to conserve the medicinal plants is by taking the part that is needed only. The study of Mathibela et al. (2015) indicates that the traditional practitioners want the authorities or the Traditional Healers Association to enforce the restriction of plants harvesting to reduce overexploitation. On another hand, Rankoana (2016) asserted that the taboo of overexploitation of medicinal plant is well practiced among the Mantheding community in Limpopo Province. It is used as a strategy to conserve the medicinal plants and ensure their availability for future uses. When an individual or healer does not observe the taboo, it is believed that the spirit of healing on the medicinal plant will leave and cause the plant to be ineffective (Rankoana, 2016). Cutting of the sides roots and filling back the soil, collecting the bark on the sides and taking a hand-filled leaves are harvesting strategies used to conserve the medicinal plants and ensure their availability (Rankoana, 2016). The current study also recorded similar observation whereby the filling back of the soil after cutting the roots is one of the strategies used to conserve the medicinal plants. Mabona and Van Vuuren (2013) raised a concern that it is difficult to sustain the harvesting of roots because it causes plant destruction. It is believed that the bark that is collected from the east side of the tree has the highest nutrition and efficacy (Semenya and Potgieter, 2014).

Consultation with the chief is one of the techniques used to ensure the availability of folk cosmeceuticals in Vhembe district. As highlighted by Mabogo (1990), when a person has to harvest the medicines from other people's place, the individuals seek permission from the chief. Consequently, the chief provides an escort for guidance on good collection practice and protection against possible tribal victimisation. Rankoana (2016) observed that the chief manages the indigenous vegetation and

has management rules that are used to ensure sustainable harvesting. The management rules are implemented to ensure the availability of natural resources by avoiding supernatural interventions such as hails and thunders.

5.5 Concluding remarks

The current study indicates that the local beliefs and societal culture strongly influence the practices employed in the preparation of folk cosmeceuticals among rural communities in Vhembe district. The practices and knowledge that are involved in the utilization of folk cosmeceuticals mainly involve the harvesting and collection as well as the rituals and taboos. The holistic nature is demonstrated in the relationship between the natural and supernatural world and the influence they have on human health. Hence, there are taboos involved in harvesting and sustenance of the availability of folk cosmeceuticals. The unwillingness of the youth to use and learn from the elders is an indication of the potential risk of losing valuable indigenous knowledge in the future. Integrating indigenous knowledge with the western knowledge can contribute to disseminating the indigenous knowledge to young people. Moreover, adding indigenous knowledge in depth in curriculums will somehow oblige young people to have the ethnobotanical knowledge and might stir up interest in them.

CHAPTER 6: CONCLUSION, RECOMMENDATIONS AND LIMITATIONS OF THE STUDY

6.1 Introduction

Culture influences the dynamics of plant knowledge and use (Heinrich, 2014).The aim was achieved by compiling the natural resources used for folk cosmeceuticals as well as documenting the associated indigenous knowledge and practices. The study was prompted to document such because it is a valuable knowledge that has been used for years. Moreover, the folk people conveyed it orally from generation to generation; though, there is no tangible record of it, hence there is need to document. The documentation of the knowledge assists in preserving it for future generations to know their heritage and the knowledge developed into skin and cosmetics products. This chapter provides the major findings and conclusion from the study. It also highlights the limitation and the recommendations of the study.

6.2 Major findings from the research

The plants, animals and microorganism were recorded as folk cosmeceuticals along with the method of preparation and the cosmeceutical purposes they are used for. The methods of administration such as paste, poultice, juice, infusion and washing of wound were also recorded. The study shows the natural resources were used as remedies to dermatological issues and are categorized into skin affliction (wound, burn, ringworms, moles, pimple), cosmetic uses (teeth hygiene, soaps, facial scrubs and mask), hair care (shampoo and dye) and antioxidants (protect skin, removes wrinkles, soften skin, body creams). The study indicates the holistic nature of folk cosmeceuticals by indicating that superstitious forces such as evil spirit and ancestors can or may cause some of the skin problems. The results indicate that the disobedience of ancestors and mistreating the traditional values and principles are some of the aspects that trigger the ancestors to afflict someone. The indicators of irrational skin problem are mostly noticed when the ordinary natural resources are not working; therefore rituals are performed for healing purposes. Moreover, the knowledge is available mostly with elders and that is a concern; for they have mentioned that young people are not interested in indigenous knowledge because they do not see its value nowadays.

The indigenous practices and knowledge recorded comprises harvesting of medicinal plants, preparing and utilization of folk cosmeceuticals. The study indicates that there are taboos involved in harvesting the medicinal plants. The taboos are culturally embedded because the study indicates that only certain ethical group performs some of the taboos. The participants believed that it is a taboo to leave the roots uncovered with soil after harvesting them because that might cause the death of plant, as a result the remedy will be ineffective. Dosage, administrating remedies and rituals are the practices mentioned in the utilization of folk cosmeceuticals. The results demonstrate that taking a small dosage was a strategy used to see if the remedy is suitable for an individual; and if one reacts to it, alternative remedy will be given. Although cosmeceuticals are known to be applied topically, the participants outlined that there are cosmeceuticals that are orally taken, interestingly, similar results are obtained as when applied topically.

Loss of medicinal plants has been a great concern all over the world. The study indicates some of the techniques that ensure the availability of folk cosmeceuticals considering that there are seasonal plants. The study indicates that there are customary rules comprised in storage, collection techniques and other strategies used to ensure the availability of folk cosmeceuticals. Consulting the chief is one of the customary laws used when collecting medicinal plants.

Therefore, the study concludes that there is a vast knowledge about folk cosmeceuticals in the study area. The rich biodiversity is a basis for the indigenous knowledge, including the ethnopharmacognosy knowledge about folk cosmeceuticals in an area of the study. Therefore, there is still need to explore more, especially the non-plant resources because most studies focus on plants. Moreover, the holistic aspect of folk cosmeceuticals, from the harvesting practices to sustainable practices, is an indication of the contribution of indigenous knowledge systems in ethnopharmacognosy. For this reason, indigenous knowledge is an empirical, unique, holistic knowledge that is culture centred; hence, every community has its own indigenous knowledge that is not shared with other cultures. The study clarifies the value of customary rules concerning sustaining the availability of natural resources, especially plants. Traditional leaders played significant role in ensuring that valuable plants were not overharvested or extinct. However, the problem commenced since traditional leadership is no longer considered to have authority in

most villages in South Africa, where the state overshadows it. Nevertheless, as stated above Vhembe district is governed by both traditional leadership and the state, which makes it easy for customary rules to be implemented in the area.

6.3 Contributions of the study

- Preservation and documentation of indigenous knowledge systems concerning folk cosmeceuticals. The action was supported by the Bill of Indigenous knowledge systems and the IKS policy 2004.
- Contribution of ethnopharmacology knowledge in South Africa, for there are limited ethnopharmacology studies regarding folk cosmeceuticals in the study area and South Africa.
- Promotion of knowledge that has potential to be developed into products for commercial purposes.

6.4Recommendations

- The concoction of more than one plant or/and combination of natural resources used for skin problems should be thoroughly validated scientifically as usually only a single plant is validated. The scientific validation will provide the insight and understanding of the ethnopharmacological knowledge regarding folk cosmeceutical that may lead to the innovations of skin products that can be commercialized.

- Indigenous knowledge should be included in depth in curriculums, for it will somehow oblige young people to learn about ethnobotanical knowledge and might stir up interest in them. .

- The customary rules concerning the conservation of medicinal plants should be implemented and the state should have policies and legislation that support and protect the customary law.

6.5Limitations

While efforts were made to implement the recommended research strategies, there are a number of challenges that have beset the present investigation. Although, there were shortcomings, the success of the study greatly outweighed them.

6.5.1 Adequacy of sample

Section 4.2.3.2 (chapter 4) described the sample size and sampling procedures of the study and it indicates that the sampling procedure was snowballing and convenient sampling. Initially the researcher had planned to interview 100 participants as sample size for the study but due to the time and resources required during the fieldwork the researcher only managed to get 71. The convenient sampling was used in some cases whereby members of the community found refused to participate. As a result, the researcher interviewed those who were willing to participate. The researcher might have recorded more knowledge about the study if s/he was able to get 100 participants.

6.5.2Data collection process

Vhembe district has four municipalities; therefore, the researcher's aim was to collect data on all four municipalities using the same number of sample in all of them. Nevertheless, the researcher could not manage to and that could have affected the overall outcome of the study. Because even though the study was conducted in Vhembe district, there are different ethnic groups there that were not covered. Besides that, the environment influences indigenous knowledge, which is a critical issue for ethnopharmacognostic study. The data received might not entirely represent the four of municipalities in Vhembe district.

6.5.3Time constraint

Time is one aspect that affected the data collection. It was too limited to collect data in all municipalities, especially when one has to introduce one's self and the study to the traditional leaders before collecting data. Consequently, that might have affected and limited the data collected.

The time was too limited to do both the introduction of the study in communities and data collections. Sometimes, the researcher would travel far just to be rejected by the traditional leaders: that became one of the challenges of the sampling number. Perhaps, more data could have been obtained from the participants.

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APPENDICES

Appendix 1: Semi-structured questionnaire

SECTION A

Questionnaire

Community: _____ Local Municipality: _____

District Municipality: _____

Date: _____

A) Socio-economic and demographic information

1. **Gender of participant**

Male	
female	

2. **Age of participant**

20-30	
31-40	
41-50	
51-70	
71-above	

3. **Type of employment if employed**

Not employed	
Informal	
Formal	

4. ***Household income monthly***

<500	
500-1500	

1501-3000	
3001- 5000	
>5000>	

5. What is your tribe?

Tshivenda	
Tsongas	
Pedi	
Others	

SECTION B NATURAL RESOURCES USED AS FOLK COSMECEUTICALS

1. What are the natural resources used to enhance physical appearance (cosmetics) and control odour among the communities in Vhembe district?

Name of plants	**Parts used**	**Utilization for what**	**Method of preparation**	**Administration**

Name of animals	**Parts used**	**Utilization**	**How do you use it**

Other natural resources (water, soil, fungi)	Utilization	How do you use it

2. What are the natural resources used to treat skin diseases among the communities in Vhembe district?

Name of Plants	Parts used	Utilization	How to use it

SECTION C INDIGENOUS KNOWLEDGE AND PRACTICES

a) What are the harvesting practices for medicinal plants or collecting the non-plant material?

- Rituals

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- Rules/Taboos

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- Time of harvest

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b) How do you practice the mentioned methods of preparation in your community?

Method of preparing cosmeceuticals	**Please explain**
1. Crushing	
2. infusion	
3. decoction	
4. grinding	
5. maceration	
6. fermentation	
7. raw not preparation	
8. other	

c) Utilization of folk cosmeceuticals

- What are the rituals that performed while using the folk cosmeceuticals?

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- How do you measure the dosage of folk cosmeceuticals?

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d) What are factors that influence the use of folk cosmeceuticals in Vhembe district?

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SECTION D CONSERVATION OF NATURAL RESOURCES USED FOR FOLK COSMECEUTICALS

a. What are indigenous techniques used to sustain the resources used for cosmeceuticals to ensure its availability?

- Customary law (taboos)

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- Storage

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OBSERVATION TOOL

Participation number: **Date:**

Area of observation	**Results**
Preparation of folk cosmeceuticals (how do they prepare the natural resources)	
Harvesting of folk cosmeceuticals (how do they harvest the folk cosmeceuticals)	
Methods of preservation (techniques used to ensure the availability of folk cosmeceuticals)	

Appendix 2:Letter of introduction with consent form

Ethnopharmacognostic study of folk cosmeceuticals in Vhembe district, Limpopo province, South Africa

My name is Setshego Mamokete Venolia (24757160) and I am a master's degree student of Indigenous Knowledge Systems (IKS) Centre, North West University Mafikeng campus. I am conducting this research for academic purposes that also require the publication. The aim of the research is to explore the ethnopharmacognostic potential of folk cosmeceuticals in Vhembe district municipality. The objective of the study is to:

a) Identify the natural resources used as folk cosmeceuticals among the communities in Vhembe district,

b) Document the indigenous knowledge and practices employed in the formulation and use of folk cosmeceuticals among communities in Vhembe district.

Therefore, interviews will be conducted with you as 'knowledge holders' or 'selected households' for data collection. I will be using the recorder to capture all data and camera for taking pictures.

The information recorded will be used for the purposes of this research and will be stored in a secured location prior to it being destroyed after 5 years. The research is purposed only for certification that also includes publication of the information. If it happens that someone utilizes the information for commercialization, the researcher will not be involved. Therefore, participants ought to deal with that person, not the researcher. Your name will not be used for free to share your knowledge about folk cosmeceuticals.

If you have any other concerns about your rights as participants that have not been satisfactorily answered by me, you may contact the following individuals

Supervisor: Dr W.Otang-Mbeng: (0130020235/Wilfred.Mbeng@ump.ac.za),

Co-supervisor Dr O.A Aremu: (018 3892573/Oladapo.Aremu@nwu.ac.za) or

The Director of IKS Centre, Prof S.A Materachera: (018 389 2294/albert.materachera@nwu.ac.za),

If you agree that the interview should go on, please carefully read the consent form attached and sign it.

Consent form

I have read and I understand the information sheet relating to the above study. I have had the opportunity to discuss and be briefed about the objectives and methods of this study and I am satisfied with the answers I have been given.

I understand that taking part in this study is purely voluntary and that I have the right to withdraw from the study at any time without fear of consequences.

I also understand that my participation in this study is confidential, and that all information derived from this interview will remain anonymous and will only be used for research purposes.

I .....
hereby consent to take part in this study and be recorded.

Date: .....

Signature: .....

Thumb print .....

Appendix 3: Ethical clearance

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

Private Bag X6001, Potchefstroom,
South Africa, 2520

Tel: (018) 299-4900
Faks: (018) 299-4910
Web: http://www.nwu.ac.za

Research Ethics Regulatory Committee
Tel: +27 18 299 4849
Email: Ethics@nwu.ac.za

ETHICS APPROVAL CERTIFICATE OF PROJECT

Based on approval by the Health Science Ethics Committee (FAST-HSEC) on 03/03/2018 after being reviewed at the meeting held on 27/02/2018, the North-West University Research Ethics Regulatory Committee (NWU-RERC) hereby approves your project as indicated below. This implies that the NWU-RERC grants its permission that, provided the special conditions specified below are met and pending any other authorisation that may be necessary, the project may be initiated, using the ethics number below.

Project title: Ethnopharmacognostic study of folk cosmeceuticals in Vhembe district, Limpopo province, South Africa

Project Leader: DR W. Otang Mbeng & DR O.A Aremu
Student: MV Setshego

Ethics number: NWU-00074-17-A9

Status: A = Submission; R = Re-Submission; P = Provisional Authorisation; A = Authorisation

Application Type: Single study

Commencement date: 2018-03-01 **Expiry date:** 2021-03-31 **Risk:** Minimal

Special conditions of the approval (if applicable):

- Translation of the informed consent document to the languages applicable to the study participants should be submitted to the HSEC (if applicable).
- Any research at governmental or private institutions, permission must still be obtained from relevant authorities and provided to the HSEC. Ethics approval is required BEFORE approval can be obtained from these authorities.

General conditions:

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, please note the following:

- *The project leader (principle investigator) must report in the prescribed format to the NWU-RERC via HSEC:*
  - *annually (or as otherwise requested) on the progress of the project, and upon completion of the project*
  - *without any delay in case of any adverse event (or any matter that interrupts sound ethical principles) during the course of the project.*
  - *Annually a number of projects may be randomly selected for an external audit.*
- *The approval applies strictly to the protocol as stipulated in the application form. Would any changes to the protocol be deemed necessary during the course of the project, the project leader must apply for approval of these changes at the HSEC. Would there be deviated from the project protocol without the necessary approval of such changes, the ethics approval is immediately and automatically forfeited.*
- *The date of approval indicates the first date that the project may be started. Would the project have to continue after the expiry date, a new application must be made to the NWU-RERC via HSEC and new approval received before or on the expiry date.*
- *In the interest of ethical responsibility the NWU-RERC and HSEC retains the right to:*
  - *request access to any information or data at any time during the course or after completion of the project;*
  - *to ask further questions, seek additional information, require further modification or monitor the conduct of your research or the informed consent process.*
  - *withdraw or postpone approval if:*
    - *any unethical principles or practices of the project are revealed or suspected,*
    - *it becomes apparent that any relevant information was withheld from the HSEC or that information has been false or misrepresented,*
    - *the required annual report and reporting of adverse events was not done timely and accurately,*
    - *new institutional rules, national legislation or international conventions deem it necessary.*
- *HSEC can be contacted for further information via Lesetja.Motadi@nwu.ac.za or 018 299 2598.*

The RERC would like to remain at your service as scientist and researcher, and wishes you well with your project. Please do not hesitate to contact the RERC or HSEC for any further enquiries or requests for assistance.

Yours sincerely

Prof Refilwe Phaswana-Mafuya
Chair NWU Research Ethics Regulatory Committee (RERC)

Appendix 4: Request and acceptance letter from traditional leaders.

Traditional Leader
N.A. Nefolovhodwe
Folovhodwe Community
2018 -03- 22
P.O. Box 1428, Mutale, 0900
Cell No: 082 752 0410
chiefnef@gmail.com

NORTH-WEST UNIVERSITY
MAFIKENG CAMPUS
FACULTY OF NATURAL AND AGRICULTURAL SCIENCES
INDIGENOUS KNOWLEDGE SYSTEMS CENTRE

The traditional leader

.....

Private bag

.....

Date.....

Dear Mr. /Mrs./Chief NEFOLOVHODWE N.A

REQUEST FOR PERMISSION TO CONDUCT RESEARCH

I am writing to request permission to conduct a research study at your village in 2017/2018. My name is Setshego Mamokete Venolia (24757160), a master's student in Indigenous knowledge systems, North West University. The research is entitled ***Ethnopharmacognostic study of folk cosmeceuticals in Vhembe district, Limpopo province, South Africa.*** The overall aim of this study is to explore the Ethnopharmacognostic study of folk cosmeceuticals used in Vhembe district, Limpopo province, South Africa. Participants will be given a consent form to be signed and returned to the researcher at the beginning of the survey.

If approval is granted, participants will complete the in-depth interviews and questionnaire in a designated location in your village. Some participants may complete the in-depth interviews and questionnaire at their designated to homes. The in-depth interviews and questionnaire results will be the pool for the dissertation/thesis projects of the research students and individual results of thesis study will remain absolutely confidential and anonymous. Should this be published, only pooled results will be documented. No cost will be incurred by either your village or the individual participants.

Your approval to conduct this study will be greatly appreciated. I will be happy to answer any questions/ concerns that you may have at that time. You may contact my supervisor DR W Mbeng at Wilfred.mbeng@ump.ac.za or 013 0020 235

If you agree, kindly sign below. Alternatively, kindly submit a signed letter of permission on your letterhead acknowledged your consent and permission for me to conduct this study at your village

Sincerely,

Signature by the researcher

.....

Signature by the traditional leader

.....

LIMPOPO
PROVINCIAL GOVERNMENT

DEPARTMENT OF
CO-OPERATIVE GOVERNANCE,
HUMAN SETTLEMENTS & TRADITIONAL AFFAIRS
TSHAKHUMA TRADITIONAL COUNCIL

Ref No: 9/2
Enq: Admin

P.O.Box 193
Tshakhuma
0951
Tel: 083 6640 786
Date: 27/02/2018

"Committed to serve the Community"

TO WHOM IT MAY CONCERN

RECOMMENDATION OF CONDUCTING RESEARCH IN OUR AREA

The above matters refers

We of the above mentioned institution hereby recommend the student of University of North West to conduct research on Ethnopharmacognostic study of folk cosmeceuticals .

The request is strongly recommended

Your attention will be highly appreciated

Yours faithfully

.....
Chairman

.....
Admin Officer

.....
Witness

DEPARTMENT OF CO-OPERATIVE GOVERNANCE
HUMAN SETTLEMENTS & TRADITIONAL AFFAIRS
TSHAKHUMA
TRADITIONAL COUNCIL
2018 -02- 27
P.O. BOX 193
TSHAKHUMA, 0951
VHEMBE DISTRICT SUPPORT CENTRE

Development is about the people