International Journal on Culture, History, and Religion
https://ijchr.net | eISSN: 3028-1318
Received: April 12, 2025 | Accepted: June 2, 2025 | Published: June 30, 2025
Volume 7 Issue No. 1 | doi: https://doi.org/10.63931/ijchr.v7i1.90

Article

Traditional and Alternative Healthcare for Hypertension and Diabetes of the Indigenous Peoples (IPs) and Locals from the Upland Areas in Bulacan

Bobby dG. Lopez[1], Allen Grace M. Sarmiento[2], Jessica M. Chozas[3], and Andrei Miguel Jose[4]

[1,3,4]College of Social Sciences and Philosophy, Bulacan State University, [2]College of Business Education and Accountancy, Bulacan State University

Correspondence: bobby.lopez@bulsu.edu.ph

Abstract

This study focused on the views and experiences of the indigenous peoples (IPs) and locals from upland areas in Bulacan on traditional and alternative healthcare for hypertension and diabetes. The study utilized a phenomenological research design and gathered data using key informant interviews and focus group discussions. Participants were selected using the purposive sampling technique. There were 10 medicinal plants identified by the participants that can manage the health risks associated with hypertension and another 17 medicinal plants for diabetes. Some of these plants were native, while others were indigenous to the Philippines. Leaves, barks, roots, and fruits were the parts of the plants being used for medication. The methods used in the extraction of its curative effect were decoction, infusion, and candying/chewing. Regarding the narrative on their potency, participants claimed that they were effective and were a big factor in improving their health conditions. It is recommended that all identified species of medicinal plants be subjected to clinical studies to test scientifically if they could be used as an alternative antihypertensive and antidiabetic drug.

Keywords: *alternative healthcare, diabetes mellitus, hypertensive diseases, indigenous peoples, medicinal plants, potency.*

Suggested citation:

Lopez, B., Sarmiento, A.G., Chozas, J., & Jose, A.M. (2025). Traditional and Alternative Healthcare for Hypertension and Diabetes of the Indigenous Peoples (IPs) and Locals from the Upland Areas in Bulacan. *International Journal on Culture, History, and Religion, 7*(1), 208-229. https://doi.org/10.63931/ijchr.v7i1.90

Introduction

Two of the many leading causes of mortality and swelling healthcare expenditures annually in the Philippines are hypertensive diseases and diabetes mellitus. In fact, from the records of the Philippine Statistics Authority (2019) in 2017, it was noted that out of 579, 237 reported deaths, 5.3 % were cases related to diabetes mellitus, while 4.6% were directly associated with hypertensive diseases. This is not to mention that there were 6.3 million Filipinos in 2008 diagnosed with diabetes (Philippine Journal of Internal Medicine as cited in Dizon, 2019) and another 12 million Filipinos who were suffering from hypertensive diseases based on the latest survey results of the Department of Health [DOH] conducted in 2017 (as cited in Orillo, 2018). Despite the serious threat these diseases pose to the lives of the people, access to treatment and medication remains to be a challenge. This is particularly true among Filipinos who are living below the poverty threshold. As a matter of fact, 48% of the population survives a day by just spending around US $2 (Wagner et al., 2008). How can this amount be enough to feed and simultaneously provide medication to a family with an average number of 4.4 members (Philippine Statistics Authority, 2016)?

To address this health concern, the government launched the DOH Hypertension and Diabetes Club in 2016 (Development Academy of the Philippines [DAP], 2021). This support group was created to assist in disseminating pertinent information, as well as to provide medication that will help in managing the health risks associated with hypertension and diabetes among patient members.

However, as of 2017, only 600,000 registered members were in the said support group (DOH- Calabarzon Center for Health Development, 2019). This figure is quite small compared to the number of people who are already suffering from the debilitating effects of these life-threatening diseases. Along with this dilemma, drugs that are necessary for its management are costly. This has been proven by the effort of the government to regulate the price of about 120 drugs in the country, which address the leading causes of death of millions of Filipinos every year --and these include medicines for hypertension and diabetes (DOH, 2019). Thus, accessibility to medications and treatments related to hypertensive and diabetic diseases remains a national concern for the Philippine government despite its previous initiatives and measures to combat these health problems.

In line with this, it was observed by UNESCO (as cited in Manoharachary & Nagaraju, 2016) that there is a growing interest in medicinal plants as a health aid or personal health maintenance for heart diseases, diabetes, high blood pressure, and even certain types of cancer in developing countries (Abdel- Aziz, Aeron, & Kahil, 2016). This is not surprising because medicinal plants were used to alleviate pain and

cure diseases as early as the dawn of human civilization. In fact, to date, around 30,000 species of plants have been discovered worldwide with great value or importance, of which 15,000 have been identified with medicinal use or potential (Manoharachary & Nagaraju, 2016). In the Philippines, however, local knowledge and the use of medicinal plants are almost lost in the consciousness of common people. People now depend on drugstores for their medicines.

With its abundant natural resources and rich biodiversity, the Philippines can be a potential source of medicinal plants with pharmacological properties that can be extracted to produce cheaper herbal drugs for hypertensive and diabetic diseases. This, in a way, could ease the burden of the government in providing more accessible medical treatment to the economically challenged sectors of the society and could possibly reduce a significant number of people dying yearly from these health conditions.

It is in this light that this study was undertaken. Moreover, it was observed in the literature that despite the widespread distribution of various drugs globally and their claimed curative effects, there were few to none in terms of studies conducted to formally assess their pharmacological qualities and the risks associated with using them (Abdel-Aziz et al., 2016; Firenzouli & Gori, 2007). This gap in research will hopefully be addressed in the second phase of its implementation. This has also been proposed in cognizance of Republic Act 8423, otherwise known as the Traditional and Alternative Medicine Act (TAMA) of 1997, which "encourages scientific research on and develop traditional and alternative health care systems that have a direct impact on public health care."

It must be noted that existing studies have failed to look into the way people see and experience diabetes and hypertension, as they are too focused on the identification of medicinal plants that will address these medical conditions (Diop et al., 2022; Karou et al., 2011; David & Johnson, 2016; Insaf et al., 2023; Okigbo, Anuagasi, & Nnoli, 2019; Fiscal & Carino-Chavez, 2016; Zhang et al., 2022). However, studies, as perceived by researchers, suggest that traditional healthcare knowledge extends beyond the use of medicinal plants. It involves understanding the illness's nature, its causes, and other associated beliefs. This comprehensive perspective is crucial for developing primary healthcare programs that are both suitable and acceptable to local communities (Marecik, 2007; Keleher, 2001; Von Wolputte & Devisch).

Presently, challenges and severe threats exist to preserving traditional/indigenous/local knowledge. Traditional / Indigenous / local knowledge refers to knowledge systems rooted in cultural traditions, beliefs, and practices of Indigenous, regional, and local communities, such as ethnobotany and

ecological knowledge, traditional medicine, craft skills, celestial navigation, traditional technologies of subsistence, ethnoastronomy and others (Sullivan, 2016). This knowledge is crucial for survival and subsistence and was accumulated through observations and close contact with the environment by locals/indigenous peoples.

Some of the threats identified relative to its preservation are the following: the "loss of the indigenous peoples' territorial base through the destruction of the rainforests, and their displacement by government projects or through commercial utilization of natural resources. This makes it impossible for many indigenous communities to sustain their knowledge. Second is the introduction of the so-called "modern" practices of agriculture and medicine. Lastly, outside researchers' misappropriation of indigenous knowledge leads to extinction (La Vina as cited in Daos, 1999, p. 5)." Unfortunately, as we have experienced, its misappropriation has led to the demonization and underestimation of its value and scientific credibility.

In response to these challenges, international and local agencies and organizations took the initiative to protect traditional/indigenous/local knowledge through (1) promotion of community documentation of indigenous knowledge systems and practices (IKSPs) and (2) giving of support in the establishment of community resource centers (Daoas,1999). Hence, this undertaking also supports these measures to secure the preservation of local cultural heritage.

The study was anchored on the Urbanization and Knowledge Loss Hypothesis and on the work of Patel (1995). The former states that urbanization negatively affects the retention and preservation of traditional or local ecological knowledge, while the latter advances the idea that primary healthcare can be enhanced significantly by understanding the worldviews and experiences of people from a particular culture on categories of disease (Gaoue et al., 2017, pp. 8–9).

This study focused on the views and experiences of the indigenous peoples and locals from upland areas in Bulacan on traditional and alternative healthcare for hypertension and diabetes. In particular, it aimed to (1) enumerate their beliefs associated with hypertension and diabetes; (2) identify medicinal plants and traditional practices used by the indigenous peoples (IPs) and locals in managing their hypertension and diabetes; (3) document the manner/s on how the IPs and locals prepared the medicinal plants to bring out their curative effects; and (4) record narratives regarding their potency.

Related Literature

Non-communicable diseases contribute to the rising number of public health issues around the world that add to premature and preventable deaths, particularly

hypertension and diabetes, which continue to be the top causes of death in the Philippines (Lim et al., 2021). The statement coincides with the data of the Philippine Statistics Authority (2023), where diabetes mellitus and hypertension rank as fourth and fifth, respectively, among the top diseases that cause death among Filipinos. According to Armstrong (2014), hypertension refers to a blood pressure that is higher than or equal to 140/90 for people under 60 and 150/90 for people over 60. Due to the lack of symptoms or warning indications, it is referred to as the "silent killer," thus preventing many people from realizing that they have hypertension. On the other hand, diabetes is defined by the World Health Organization [WHO] (2023) as a chronic and metabolic disease characterized by elevated levels of blood glucose (or blood sugar), which leads over time to serious damage to the heart, blood vessels, eyes, kidneys, and nerves. With this, the burden of diabetes and hypertension, with their accompanying risk factors and complications, is upon the Filipinos, as Asia, where the Philippines is located, owes this to huge population numbers and increasing prevalence rates, mostly influenced by heredity and lifestyle (WHO, 2023).

In response to these, the Philippine government has implemented and established various programs and initiatives to help diabetic and hypertensive people. These programs aim to improve access to affordable healthcare, promote healthy lifestyles, and provide support to individuals living with these conditions. For instance, the Department of Health (DOH) established the Hypertension and Diabetes Club in 2016. This nationwide program aims to treat individuals with diabetes and hypertension by providing patients with access to free maintenance drugs for diabetes, high blood pressure, and high cholesterol to prevent and control the complications of these non-communicable diseases (DAP, 2021). Another initiative program of the Department of Health (DOH) in cooperation with the World Health Organization (WHO) is the "Healthy Hearts Program," which is designed to improve cardiovascular health and reduce mortality caused by NCDs (non-communicable diseases), including hypertension and diabetes. The program aims to train barangay health workers to perform simple blood pressure readings and encourage the community to have a healthy lifestyle (Junio, 2023).

Despite these efforts, diabetes and hypertension care in the Philippines still has a long way to go, as there are many challenges in addressing them in terms of resources, government support, and other related factors (Tan, 2015; Sison et al., 2020). For instance, the national insurance system does not cover comprehensive diabetes care in a preventive model, giving only P15,800 for diabetes mellitus with coma or ketosis cases. In terms of hypertension, only P 9,000 is given for confinements at accredited hospitals (Philippine Health Insurance Corporation, 2019; Jaymalin, 2023).

Thus, most patients rely on "out-of-pocket" expenses, namely, laboratory procedures and daily medications. The study conducted by Mendoza et al. (2022) found that most of the primary care and medication for hypertension and diabetes are still provided in clinics and hospitals. Thereby, visiting health centers may not be convenient for everyone due to other priorities. This also shows that even with advancements in the healthcare field, not all can access proper care and medications.

With these challenges present, many Filipinos resort to traditional medicine. The World Health Organization (WHO) defines traditional medicine as the sum total of the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness (WHO, 2011). Most people use such medicines because they believe they are culturally acceptable, less dangerous, and more natural than conventional ones. Accessibility, availability, and affordability also contribute to why people prefer this kind of medicine.

One of the advocates of the use of herbal medicine in the Philippines is the former Secretary of Health and Senator Dr. Juan Flavier. Long before he became a senator, he was known as the "doctor to the barrios" in Nueva Ecija and Cavite. At this time, he became exposed to the use of herbal/ alternative medicine. During Ramos' administration as DOH Secretary, he encouraged people to use traditional and alternative medicines. Under his leadership, DOH adopted ten medical plants that were thoroughly tested as legitimate medicines and had been clinically proven to have medicinal value (Guererro, 2016). This eventually led to the passage of Republic Act 8423, otherwise known as "The Traditional and Alternative Medicine Act of 1997". Its main goal is to improve the quality and delivery of healthcare services to the Filipino people through the development of traditional alternative healthcare and its integration into the national healthcare delivery system. This underscores the importance of using herbal medicines as an alternative form of treatment and emphasizes the effectiveness of their medicinal properties.

Methodology

The study utilized a phenomenological research design and gathered data using key informant interviews (KII) and focus group discussions (FGD). In phenomenological research, judgment on the natural world is suspended to place more emphasis on people's experiences of a phenomenon (Duquesne University, 2023, para.1).

This study focused on the province of Bulacan, located in Central Luzon, which has been identified as one of the regions in the country with the highest mortality rates due to hypertension and diabetes mellitus. Bulacan is bordered by Nueva Ecija to the north, Aurora to the northeast, General Nakar to the east, Rizal to the southeast, Metro Manila to the south, Manila Bay to the southwest, and Pampanga to the west. Encompassing a total land area of 279,610 hectares, Bulacan comprises four cities and twenty municipalities (Provincial Government of Bulacan, 2022, "Bulacan Province" Section). This study particularly focused on five highland municipalities—San Miguel, San Rafael, San Ildefonso, Norzagaray, and Angat—which are known for their rich biodiversity and are home to Indigenous communities, including the Dumagat. These areas contain barangays and remote communities where residents continue to practice alternative healthcare methods, including the use of medicinal plants, to manage hypertension and diabetes.

The selection of participants followed a purposive sampling approach, ensuring that only individuals meeting specific criteria were included. The inclusion criteria were as follows: (1) residents of upland rural areas in Bulacan; (2) identified as indigenous peoples, herbolarios (traditional healers), faith healers, or older members of the community; (3) aged between 45 and 64 years; and (4) with direct experience in using medicinal plants to manage hypertension and diabetes. In each barangay, two participants were selected for key informant interviews (KII), while a group of six participants was organized for focus group discussions (FGD). The study covered a total of 10 barangays across the five selected municipalities.

Data collection was conducted through multiple methods, including narrative interviews, field notes, photographs, transcriptions of KII and FGD sessions, and the culturally grounded practice of *pakuwento-kuwento*—a Filipino storytelling approach wherein the researcher listens to participants' personal experiences related to the phenomenon under study. Observations of non-verbal cues such as gestures, body language, and eye contact were also made to assess participants' sincerity and authenticity during interviews.

To analyze the collected data, thematic analysis was employed, focusing on identifying recurring patterns and themes within the qualitative data (Braun & Clarke, 2006). This method acknowledges the reflexive role of the researcher, whose subjective experience and interpretive lens are crucial in making sense of the data. Through this iterative and reflective process, the study was able to capture the nuanced perspectives of Indigenous and local communities regarding the use of alternative healthcare practices for hypertension and diabetes in upland Bulacan.

The researchers coordinated the project with the concerned authorities in their research locale after receiving the consent of the university's Research Ethics Committee. The authorities considered in the study include the municipality's mayor, the barangays' chairpersons, and the Indigenous Peoples Mandatory Representative (IPMR). Gatekeepers were then identified and focus group discussions and interviews were scheduled. During the data gathering period, the researchers provided informed consent to the participants to ensure that they were aware of the study's purpose, the nature and extent of their participation, and their rights and benefits as participants in the study. Upon completion of the initial draft of the research manuscript, the researchers returned to the field sites to determine if the conclusions they reached about the study were consistent in any way with the perspectives and understandings of the participants. The anonymity of the participants' identity, the privacy of their data, and several pertinent IPRA provisions were all considered during the study to safeguard the participants' rights and welfare. Goods were given to all participants after their participation, and tokens were developed as tokens for an extension program relevant to the needs of the community.

Results and Discussion

Beliefs Associated with Hypertension and Diabetes

Participants strongly believed that diabetes and hypertension were both a kind of sakit (roughly translated as illness). Sakit as described by participants was fatalistic ("delikadao kapag lumalala"; "talagang ikinamamatay"), non-curable but manageable ("gagaling siya, babalik"), specifically in the case of hypertension and diabetes, and characterized by feebleness ("matamlay"; "nanlalambot"), fever ("nilalagnat"), teary eyes with frequent yawning ("lumuluhang mata"; hikab nang hikab), and unpleasant feeling ("masama ang pakiramdam"; "hindi maayos ang katawan"). All of these descriptions were manifestations of either poor health or severe medical conditions. So, in this particular context, it indicates that it is not just a feeling of pain brought about by an aberration of the normal function of a specific body part, such as headache and stomach ache, but rather a general physical condition that affects the well-being of a person (De Castro & Alvarez, 2003) or what Tan (2008) described as a state of experiencing a serious physical condition that may affect or threaten the normal functioning of a person (may sakit).

As sakit, hypertension and diabetes have various symptoms or manifestations as expressed by the participants. Hypertensive participants often claimed that they experienced dizziness ("naliliyo"; "nahihilo"), feebleness ("nanlalata"), nape pain ("masakit yung batok"), chest pain and palpitation ("naninikip ang dibdib at

kumakabog"), body immobility ("hindi ako makabangon"), extreme body heat (ïnit na init ka"), heavy feeling ("mabigat yung pakiramdam"), and numbness ("parang namamanhid"), whenever their blood pressure is getting high. Contrary to some medical findings, it typically exhibits no warning signs or symptoms (Centers for Diseases Control and Prevention, 2021, para. 14; American Heart Association, 2023, para. 1). Such were the medical conditions identified by most of the participants when they were hypertensive. This may be attributed to their experiences, which have already escalated to the level of hypertensive emergency crisis, with blood pressure higher than 180/120 mm Hg, as described by the American College of Cardiology and the American Heart Association (as cited in Mayo Foundation for Medical Education and Research (MFMER), 2022, para 4). It was assumed because the symptoms mentioned by the participants coincided with the descriptions provided by the World Health Organization (2023) with people with blood pressure higher than 180/120 mm Hg, like severe headache, chest pain, dizziness, difficulty in breathing, nausea, vomiting, blurred vision or other vision changes, anxiety, confusion, buzzing in the ears, nosebleeds, and abnormal heart rhythm (para.11).

On the other hand, those diabetic participants averred that they often suffered from blurry vision ("lumalabo yung paningin"), dizziness (nahihilo), trembling and absent-mindedness ("naginginig buong katawan tapos nabablangko"), numbness ("namamanhid"), itchiness ("nangangati"), more frequent urination ("madalas umihi"), feebleness ("nanlalata"), prolonged wound recovery ("matagal gumaling"), and vomiting ("nagsusuka"), whenever their blood sugar level increases. Although they are aware of its symptoms, they cannot categorically identify whether it is Type 1 or Type 2 diabetes. In spite of that, the researchers would like to believe that it was Type 2 diabetes because most of the symptoms enumerated by participants coincided with the medical conditions of people with Type 2 diabetes as expressed by medical experts, such as increased thirst, frequent urination, increased hunger, fatigue, blurred vision, slow-healing sores, frequent infections, numbness or tingling in the hands or feet, areas of darkened skin, usually in the armpits and neck, and having very dry skin. (Mayo Foundation for Medical Education and Research (MFMER), 2023, para. 5; Osborn, 2022, para. 21; Poulson, 2023, para. 9; Sracocic, 2022, para. 6; American Diabetes Association, 2023, para. 2). On top of that, most of the participants were people who acquired the said medical condition at the age of 45 and above, a stage of life where Type 2 diabetes is more prevalent. This is not to mention that in the Philippines, according to Dr. Michael Villa (as cited in Cudis, 2021), President of the Philippine Society of Endocrinology, Diabetes, and Metabolism," Type 2 diabetes makes up about 85 percent of patients with diabetes" (para. 10).

As to the causes of these medical conditions, financial instability ("walang pera"), psycho-emotional factors ("galit lagi"; "palaging stress"), exhaustion ("napapagod po"), unhealthy diet ("sa kinakain na rin po), extreme heat ("sobrang init"), lack of exercise ("bihira ako mag-ehersisyo"), lack of sleep ("hindi nakakatulog"), and genetic susceptibility ("lahi po namin"), were pinned down for hypertension while unhealthy diet ("matatamis na pagkain;" "malakas sa de bote"), and genetic susceptibility (namamana) for diabetes. The perceptions and knowledge of the participants on the possible causes of these health issues have sound and medical bases (Edwards, 2022, para.5; Cleveland Clinic, 2023, para. 16; Merino et al., 2022; Lopez-Jimenez, 2022, para. 2) as they were acquired from consultation with healthcare professionals, experts' opinion from social media, and experiences of those who have these medical conditions for a long time. This was supported by the study of Szymona-Pałkowska et al. (2016), which states that "patients derive the knowledge of their disease from various sources, for example, information from physicians or other health care professionals, using other sufferers' opinions, information available in mass media, scientific journals, or the internet forums" ("Discussion" Section, para. 1). One may also notice from the list of causes of hypertension that financial instability was included. Although it appeared to be unrelated, it is one of the top causes of stress, which is a factor that contributes to high blood pressure. According to Unilab, Inc. (2019), "high levels of stress can also considerably raise the risk of getting hypertension" (para. 2).

It is quite noticeable that participants view hypertension and diabetes as serious illnesses requiring early medical attention to prevent complications and potentially life-threatening risks.

Traditional Practices and Medicinal Plants Being Used for Managing Hypertension and Diabetes

Practices in Treating Hypertension and Diabetes

Both hypertension and diabetes require careful and lifetime management. Listed below are the practices to treat hypertension and diabetes, namely: healthy diet, exercise, body moisturization, taking synthetic drugs, and the use of herbal medicines.

Healthy Diet. Maintaining a healthy diet is essential for the control of hypertension. By decreasing blood pressure and reducing the risk of heart disease and stroke, among other things, it serves to enhance overall health. As stated by one of the informants, "I was advised to take a diet, and I was made to stay away from foods I was eating." Another is, "No, I don't eat what needs to be avoided." Berman (2023)

claimed that changing one's diet is a tried-and-true method for lowering blood pressure.

In terms of diabetes, the most obvious way to manage blood sugar levels is to lessen the number of sweets in their diet; as one respondent stated, "avoiding sweets and soft drinks" is key to maintaining normal blood sugar levels. Sugar-filled foods and beverages have been shown to have a negative impact on diabetics' health (Gonzales et al., 2021). With this, less sugary food consumption is strongly advised to augment diabetes treatment and prevention.

Exercise. The advantages of exercise for those with diabetes and hypertension are immeasurable (Harvard Health Publishing, 2023). Exercise improves blood pressure, raises good cholesterol, lowers dangerous cholesterol and triglycerides, strengthens bones and muscles, eases anxiety, and helps maintain a healthy weight. As expressed by the informants, "I'm excreting sweat," and "I do exercise, like walking." The effectiveness of exercise on hypertension is well supported by research, which contends that exercise lowers blood pressure and halts the onset and progression of hypertension (Gambardella et al., 2020). Similarly, blood sugar levels have been found to be lowered in diabetics who walk for at least two hours a week, engage in weight training, and/or perform aerobic activity (Harvard Health Publishing, 2023).

Body Moisturization. Most informants believed that body moisturization eases their high blood pressure symptoms and helps them relax. As stated by one of the respondents, "I'm wetting my mouth because I'm shaking.", Others reacted, "I'm pouring water on my feet," Still, others specifically described the procedure, "Get a dipper, fill it with water then get a towel, squeeze it, then put it on your forehead." Body moisturization or just taking a bath can lower blood pressure because it relaxes the muscles, resulting in less blood and pressure in the body, which results in lower blood pressure. This improves heart and blood vessel function (Healthy Hildegard, 2020).

Taking Synthetic Drugs. Synthetic drugs and natural remedies stand out among the treatment choices for treating hypertension and diabetes. Most of the informants still believe in technological advancements in the field of medicine. However, they are also concerned about the side effects of what synthetic drugs can do to their body. Modern, synthetic medications may help people, but they can also have unfavorable side effects that bring harm to patients (Subudhi, 2023). Some of the adverse effects could be headaches, nausea, rashes, dizziness, and difficulty in breathing. While the side effects may be mild or temporary, it still can impact the patients. As a result, they resort to natural medications such as herbal medicines. As

one of them said, “I take only mild medication, like lozartan.” Another is, “The doctor prescribed me to take metformin, but I experienced stomachache, so I resorted to herbal medicine.” This shows that using herbal medications benefits its users; nevertheless, it should be mentioned that not all herbal medicines are safe to use because they lack quality control and proper labeling, and they do not include the appropriate patient information, according to the users (Raynor, 2011).

Use of Herbal Medicines. Despite technological advancements in the field of medicine, Filipinos still patronize herbal medicines. Prior to European conquest, Filipinos had a defined medical tradition with a holistic perspective comparable to Southeast Asian medical traditions. It encompassed not only the physical but also the psychological and spiritual aspects of existence, implying that a shared cultural foundation existed among them prior to the conquest (Planta, 2017). In modern times, the use of herbal medicine is included in the broad category of complementary and alternative medicine used as a kind of alternative treatment. Herbal medicines are often used as a cure for diabetes as many people believe that their bitterness has healing properties. As the saying goes, “Bitter taste, better cure.” The effect of bitter flavor is attributed to glucose regulation by improving the sugar level. It also decreases insulin resistance (Chen et al., 2015). In connection with the statements of the informants, “Since my parents are drinking herbal, when I found out that I have diabetes, they told me to drink herbal medicines.” Another is, “We use blue ternate and serpentina.” As for some, boiling and drinking the extract of the leaves can be of help, “For me, I only drink guyabano leaf and guava leaves.” Another claimed, "When my blood sugar spiked, I ate the leaf of a plant named insulin plant.” Diabetes is associated with sugar; therefore, a bitter taste is needed to counter the excess sugar and maintain the balance inside the body. In addition to this explanation, there is a widespread belief that the bitter taste coming from medicinal plants is the very substance needed and expected to kill the deadly microbes causing harm to the human body; this is more evident, for instance, in traditional Chinese medicine (TCM), where a bitter pill or elixir is combined with other medical practices like moxibustion, acupuncture, and tai chi, expecting it to bring miraculous healing to the sick (Glendenning, 1994; Matos et al., 2021).

On the other hand, in terms of hypertension, informants stated that they drink herbal medicines such as pandang lalaki, dahon ng guyabano, tanglad, serpentina, kalamunding, and sambong, whenever they think or feel they have high blood pressure or to maintain normal blood pressure. They contend that herbal remedies are typically thought to be safer than prescription medicines and to have less side effects than ingesting synthetic drugs. In connection with the study of Willcox et al. (2021),

herbal medicines are often used for remedies and are tested effective and safe. Also, many of these herbals consist of herbs and spices with properties that are common food products and, as such, are generally considered safe.

Medicinal Plants Used to Treat Hypertension and Diabetes

Table 1. Medicinal Plants

Scientific Name	Medicinal Plants	Part/s of Medicinal Plant being used for medication	Treatment
Annona muricata	Guyabano	Bark, Fruit Skin, Leaves	Diabetes
Misosa pudica	Makahiya	Leaves	Diabetes
Chrysophyllum cainito	Caimito	Leaves, Fruit Skin	Diabetes
Persea americana	Avocado	Leaves	Diabetes
Cymbopogon citratus	Tanglad	Leaves	Diabetes, Hypertension
Psidium guajava	Guava	Leaves	Diabetes, Hypertension
Pandanus amaryllifolius	Pandang Lalaki	Leaves	Diabetes
Blumea balsamifera	Sambong	Leaves	Diabetes, Hypertension
Eleusine indica	Paragis/Bakiskisan	Leaves	Diabetes
Curcuma longa	Luyang dilaw	Fruit	Diabetes
Lagerstroemia speciosa	Banaba	Leaves	Diabetes
Mangifera indica	Mangga	Leaves	Diabetes
Clitoria ternatea	Blue Ternate	Flower	Diabetes
Abelmoschus esculentus	Okra	Vegetable	Diabetes
Costus igneus	Insulin Plant	Leaves	Diabetes
Rauvolfia serpentina	Serpentina	Leaves	Diabetes, Hypertension
Orthosiphon stamineus	Taheebo	Leaves	Hypertension
Moringa oleifera	Malunggay	Leaves	Hypertension
Euphorbia hirta	Tawa-tawa	Leaves	Hypertension
Angelica keiskei	Ashitaba	Leaves	Hypertension
Peperomia pellucida	Pansit-pansitan	Whole plant (washed)	Hypertension
Citrus microcarpa	Kalamunding	Juice of the fruit	Hypertension

The popularity of herbal medicines has surged globally, with their use in healthcare settings increasing rapidly. These natural medicines are now found in pharmacies, grocery stores, and supermarkets. In underdeveloped countries, up to four billion people rely on herbal medicines for healthcare, and some communities consider their use as an essential part of their culture (World Health Organization, 2004). In the Philippines, the use of herbal medicines can be traced back long before the arrival of the colonizers. Spanish friars, in their chronicles, witnessed the healing practices and rituals performed by the herbolarios, the term from which the word "albularyo" originated, since they used herbs in healing the sick. These herbs can either be consumed orally or externally (tapal or pahid). However, Planta (2017) discussed that traditional medicine in the Philippines does not refer to a single medical system alone. The Indians and the Chinese contributed their medical traditions through trade. As a result, a plurality of medical systems is used in the country, which is a product of a long process of Filipino ways of healing illnesses.

Numerous herbal medicines have been investigated for their potential to assist diabetics in managing their blood sugar levels and people with hypertension in managing their blood pressure level. For instance, guyabano and malunggay both hold high quantities of vitamins A, B, C, E, and K, which help balance salt and appropriate fluid balance in the body. This then leads to a boost in the immune system that can help control blood sugar and blood pressure. Another is makahiya and sambong, which have diuretic properties that reduce diabetes levels like the majority of blood sugar medicines, while others also use it for lowering blood pressure through consuming the juice of its leaves. As for caimito and guava are used to lower blood sugar and blood pressure due to its potassium content. Meanwhile, avocados are rich in oleic acid, which can help lower cholesterol and blood sugar. Moreover, tanglad, pandang lalaki, bakiskisan (also called paragis), luyang dilaw, banaba, pansit-pansitan, sambong, taheebo, malunggay, tawa-tawa, guava, ashitaba, and kalamunding all have antioxidant, antimicrobial, and anti-inflammatory properties that help in reducing bad cholesterol, regulating blood pressure and level of blood sugar. As for the mangga, or mangoes, they contain mangiferin, a compound that is said to have blood sugar-lowering effects. There is also the blue ternate, whose flower is used in traditional medicine to treat a wide range of illnesses, including diabetes. Lastly, the insulin plant and serpentina that contain compounds such as costunolide, stigmasterol, and quercetin have been shown to have hypoglycemic effects that help in lowering blood sugar levels.

The majority of the herbal plants stated are not endemic in the Philippines. Some of them came from Central, West, and South America, East, West, and Southern

Asia. In the Philippines, most of the herbal medicines are found within the respondents' vicinity, hence their familiarity with the plants. Also, due to its accessibility, affordability, and availability, the people maximize the "gift" of nature in dealing with their illnesses. In relation with Petrovska's study (2012), it was mentioned that familiarity with the plants contributed to the number of people using herbal medicine. Most of the time, knowledge about the medicinal properties of a certain plant comes from the elders, friends, and neighbors in the community who are also experiencing the same symptoms and disease. As for the usage of herbal plants, some methods include the whole herb while others are just a portion or part of a plant like the stem, the roots, and the leaves. The leaf is the most widely used part of the plant for cure for its solubility and digestibility.

Extraction of the Medicinal Plants' Curative Effect and the Narratives of Their Potency

It can be gleaned from the data that across all barangays the most common ways of extracting the curative effect of the medicinal plants for diabetes and hypertension are through decoction, steeping, and chewing. The participants consistently say that most of them resort to decoction, as noted in their statements, such as "I'm just brewing the leaves of the herbal plants "or "I boil it for a few minutes." Decoction, as defined by Bitwell et al. (2023), is a method of extracting chemicals by boiling herbs or plant material, including stems, roots, bark, and rhizomes. Steeping is another method that they use in the preparation of herbal medicines. In relation to this, many participants said that "I just soak it in water." As a process, steeping extracts the flavor and health-promoting chemicals from the material used to produce tea through the soaking of leaves in a liquid or water, either hot or cold (Danahy, 2020). Finally, some resort to chewing to extract the medicinal plant's therapeutic effects, as evidenced by expressions such as "I make it like candy, I chew it directly." Chewing, as described by Watanabe (2014), is a process by which an herbal plant is crushed and mashed by the teeth in order for enzymes to break it down more efficiently. Obviously, medicinal plants are used internally, whether the active ingredient is extracted through decoction, steeping, or chewing.

Participants added that they had mixed two or more medicinal plants to create more effective herbal medicines. This assertion of the participants was confirmed in the study by Sofowora et al. (2013), which stated that some plants were administered in combination with other plants to increase the effectiveness of herbal medication (p.84). In most instances, it was observed from the participants' narratives that the usual number of medicinal plants that they use to combine to ensure their efficacy is seven. This practice may be associated with the Filipino belief that this number brings

fortune and prosperity. This Filipino worldview, in turn, can be attributed to the influence of either the Chinese, particularly Confucianism and Taosim religious-philosophical traditions, or Hebrew cultures, which believed that the number "seven" was a sign of "balance", "harmony", "completeness", and "wholeness" (Liu & Ann, 2021; Farbridge, 1923) This perhaps will explain why most of the participants used to combine seven medicinal plants in preparing their herbal medicines. Clearly, the medicinal plants in this study were utilized as curative medicines, that is, as a tool to cure an existing illness in the body.

Regarding the amount or frequency of use of medicinal plants, the data revealed that it varies and becomes a matter of choice and preference for the participants. Some said, "I drink it when I don't feel well," while others said they take it "when they are thirsty". Others mentioned "once a night," "three glasses per day," "two glasses during the day," and "six glasses a day". Notable among the responses is the fact that participants only resort to drinking herbal medicine whenever they start to feel unwell and stop the moment, they feel better. Some use it as an alternative medicine due to a lack of money to buy over-the-counter prescription drugs, while others use it alternately with synthetic drugs. A few have already acquired the habit of taking herbal medicine on a regular basis, much like tea, to maintain their health. These variations in dosage when using medicinal plants may be attributed to their unique nature, which makes giving an exact measure or dose of their active ingredients difficult; thus, the approach to giving dosage regarding their use varies from country to country or within the country. From here, we can deduce the belief that the efficacy of medicinal plants can be obtained over a wide range of doses (Benzie & Wachtel-Galor, 2011).

All participants claimed they felt better after drinking the herbal medicine. They attributed the relief they felt to the consumption and ingestion of the herbal medicine that they prepared. As they said, their blood pressure and sugar levels both went back to normal, and all of their symptoms were gone through it. In relation to this, evidence of medicinal plant effectiveness was relatively limited. However, studies were saying that if they were used correctly, they could be of help in disease prevention, treating various medical conditions, and even in the production of plant-based medicines (Sofowora et al., 2013; Icahn School of Medicine at Mount Sinai, 2023).

Conclusions and Recommendations

Participants believed that diabetes and hypertension are conditions that need to be taken seriously in order to avoid their life-threatening complications. If they are correctly handled and addressed as their symptoms worsen, their crippling effect can

be minimized. They used a variety of strategies to treat these illnesses, including regular exercise, eating a balanced diet, and moisturizing the skin to regulate body temperature. These were simultaneously put into practice with the use of medicinal plants. The medicinal plants used were either non-native or indigenous to the Philippines. They abound in the place and are so accessible to the participants that they can even be found in their backyard and on the sides of the public walkways and highways. The part of the plant used the most for medicine is the leaf.

It was either chewed, decocted, or steeped to obtain its medicinal effect. Medical professionals, social media influencers, parents, neighbors, and friends were the most common sources of information concerning this. Participants discussed the Medicinals' potency, saying they would recommend them to others because they significantly improved their health conditions. In addition, they believed that the efficacy of medicinal plants can be attained at a wide range of doses. It is recommended that future research focus on investigating whether the medicinal plants in the study, through biochemical analysis and clinical testing, can be used to develop anti-hypertensive and diabetic drugs. Parallel to this, a proposal to build a greenhouse nursery for propagating the identified medicinal plants will be crucial for conducting the clinical trials.

Conflicts of Interests

The authors declare that there are no conflicts of interest regarding the publication of this paper.

References

[1] Abdel-Aziz, S.M., Aeron, A., Kahil, T.A. (2016). Health Benefits and Possible Risks of Herbal Medicine. In: Garg, N., Abdel-Aziz, S., Aeron, A. (eds) Microbes in *Food and Health*. Springer, Cham. https://doi.org/10.1007/978-3-319-25277-3_6

[2] American Heart Association, Inc. (2023, May 31). Why high blood pressure is a "silent killer." *American Heart Association*. https://www.heart.org/en/health-topics/high-blood-pressure/why-high-blood-pressure-is-a-silent-killer

[3] Benzie, F., & Wachtel-Galor. (2011). *Herbal medicine: Biomolecular and clinical aspects* (2nd ed.). CRC Press.

[4] Berman, J. (2023, August 20). High blood pressure and diet. *Medline Plus*. https://medlineplus.gov/ency/article/007483.htm#:~:text=Making%20changes%20to%20your%20diet,create%20a%20healthy%20meal%20plan

[5] Bitwell, C., Indra, S., Luke, C., & Kakoma, M. K. (2023). A review of modern and conventional extraction techniques and their applications for extracting phytochemicals from plants. *Scientific African Journal, 19*. https://doi.org/10.1016/j.sciaf.2023.e01585

[6] Centers for Disease Control and Prevention. (2021, May 18). *High blood pressure symptoms and causes.* https://www.cdc.gov/bloodpressure/about.htm

[7] Chen, H., Guo, J., Pang, B., Zhao, L., & Tong, X. (2015). Application of herbal medicines with bitter flavor and cold property on treating diabetes mellitus. *Evidence-Based Complementary and Alternative Medicine, 2015*, 529491. https://doi.org/10.1155/2015/529491

[8] Daoas, D. (1999). *Efforts at protecting traditional knowledge: The experience of the Philippines*. NCIP.

[9] Davids, D., Gibson, D., & Johnson, Q. (2016). Ethnobotanical survey of medicinal plants used to manage High Blood Pressure and Type 2 Diabetes Mellitus in Bitterfontein, Western Cape Province, South Africa. *Journal of Ethnopharmacology, 194*, 755–766. https://doi.org/10.1016/j.jep.2016.10.063

[10] De Castro, L., & Alvarez, A. (2003). Sakit and karamdaman: Towards authenticity in Filipino concepts of disease and illness. In R. Z. Qiu (Ed.), *Bioethics: Asian perspectives* (pp. 105–106). Kluwer Academic Publishers. https://link.springer.com/chapter/10.1007/978-94-017-0419-9_10

[11] *Department of Health*. (2019, September 26). DOH unveils list of 120 medicines proposed for price regulation. https://doh.gov.ph/press-release/DOH-unveils-list-of-120-medicines-proposed-for-price-regulation

[12] *Development Academy of the Philippines*. (2021, April 1). Establishment of hypertension and diabetes club in adopted community. https://coe-psp.dap.edu.ph/compendium-innovation/establishment-of-hypertension-and-diabetes-club-in-adopted-community/

[13] *Diabetes Australia*. (2013, September 1). Social media's influence on Diabetes treatment and self-care. https://www.diabetesaustralia.com.au/blog/social-medias-influence-on-diabetes-treatment-self-care/

[14] Diop, M., Niang-Diop, F., Dieng, S. D., Samb, A., Djidiambone Manga, G. E., Sané, A. P., Sène, M. B., Sambou, B., Goudiaby, A., & Diatta, E. A. (2022). Ethnobotanical study of medicinal plants for treatment of diabetes and hypertension used in communities near Fathala Forest, Senegal. *Ethnobotany Research and Applications, 23*, 1–15. https://ethnobotanyjournal.org/index.php/era/article/view/2899

[15] Dizon, G. (2019, September 14). 1 in 5 Filipinos are diabetic or pre-diabetic—You might be, too. *Philstar*. https://www.philstar.com/lifestyle/health-and-family/2019/09/14/1950940/1-5-filipinos-are-diabetic-or-pre-diabeticyou-might-be-too

[16] *DOH-CaLaBaRZon Center for Health Development*. (2019, April 7). DOH conducts health fair for members of hypertension and diabetes clubs in CaLaBaRZon. https://ro4a.doh.gov.ph/140-featured-article/520-doh-conducts-health-fair-for-members-of-hypertension-and-diabetes-clubs-in-calabarzon

[17] Farbridge, M. H. (1923). *Studies in biblical and semitic symbolism*. K. Paul, Trench, Trubner & Co., Ltd. https://archive.org/details/studiesinbiblica00farb/page/132/mode/2up

[18] Firenzouli, F., & Gori, L. (2007). Herbal medicine today: Clinical and research issues. *Evidence-Based Complementary and Alternative Medicine, 4*(1), 37–40. https://doi.org/10.1093/ecam/nem096

[19] Fiscal, R., & Carino-Chavez, A. C. (2016). Ethnobotanical profiling of commonly utilized plants for hypertension and diabetes in the province of Laguna, Philippines. *International Journal of Science and Research (IJSR), 5*(9), 152–154. https://doi.org/10.21275/ART20161424

[20] Gambardella, J., Morelli, M., Wang, X. J., & Santulli, G. (2020). Pathophysiological mechanisms underlying the beneficial effects of physical activity in hypertension. *The Journal of Clinical Hypertension, 22*(2), 291–295. https://doi.org/10.1111/jch.13804

[21] Gaoue, O. G., Coe, M. A., Bond, M., Hart, G., Seyler, B. C., & McMillen, H. (2017). Theories and major hypotheses in ethnobotany. *Economic Botany, 20*(10), 1–19.

[22] Glendinning, J. I. (1994). Is the bitter rejection response always adaptive? *Physiology & Behavior, 56*(6), 1217–1227. https://doi.org/10.1016/0031-9384(94)90369-7

[23] Gonzales, G., Tseng, T., Lin, W., Kao, Y., Chen, L., & Lin, H. (2021). Sugar intake from sweetened beverages and diabetes: A narrative review. *World Journal of Diabetes, 12*(9), 1530–1538. https://doi.org/10.4239/wjd.v12.i9.1530

[24] Harvard Health Publishing. (2023, August 2). The importance of exercise when you have diabetes. *Harvard Medical School*. https://www.health.harvard.edu/staying-healthy/the-importance-of-exercise-when-you-have-diabetes#:~:text=Exercise%20lowered%20HbA1c%20values%20by,didn%27t%20lose%20any%20weight

[25] Healthy Hildegard. (2020). 8 home remedies for high blood pressure. *Healthy Hildegard*. https://www.healthyhildegard.com/home-remedies-for-high-blood-pressure/

[26] Insaf, M., Ghizlane, H., Ghada, B., Fadoua, E., Samiha, K., Youness, E. Abdali, & Mohamed, F. (2023). Plant-based bioproducts for the control of diabetes and hypertension in Tangier Tetouan Region (Morocco). *Tropical Journal of Natural Product Research (TJNPR), 7*(9), 4016–4025. https://www.tjnpr.org/index.php/home/article/view/2653

[27] Junio, R. (2023, June 21). DOH, WHO scale up efforts to prevent cardiovascular diseases in Western Visayas. *World Health Organization - Western Pacific Philippines*. https://www.who.int/philippines/news/detail/21-06-2023-doh--who-scale-up-efforts-to-prevent-cardiovascular-diseases-in-western-visayas

[28] Karou, S. D., Tchacondo, T., Djikpo Tchibozo, M. A., Abdoul-Rahaman, S., Anani, K., Koudouvo, K., … de Souza, C. (2011). Ethnobotanical study of medicinal plants used in the management of diabetes mellitus and hypertension in the Central Region of Togo. *Pharmaceutical Biology, 49*(12), 1286–1297. https://doi.org/10.3109/13880209.2011.621959

[29] Keleher, H. (2001). Why primary health care offers a more comprehensive approach for tackling health inequalities than primary care. *Australian Journal of Primary Care, 7*(2), 57–61.

[30] Lim, K., Rivera, B., Samson, R., & Garcia, F. (2021). Factors associated with hypertension and diabetes among risk-assessed patients in a Pasig City health center. *Philippines Journal of Health Research and Development, 25*(24), 53–60.

[31] Liu, G., & An, R. (2021). Applying a yin–yang perspective to the theory of paradox: A review of Chinese management. *Psychology Research and Behavior Management, 14*, 1591–1601. https://doi.org/10.2147/PRBM.S330489

[32] Longden-Naufal, C., Rolfe, V., & Mackonochie, M. (2022). Narratives of herbal medicine utilisation in the United Kingdom: Scoping literature review. *Frontiers in Pharmacology, 13*(1), 131–133. https://doi.org/10.3389/fphar.2022.886574

[33] Manoharachary, C., & Nagaraju, D. (2016). Medicinal plants for human health and welfare. *Annals of Phytomedicine, 5(*1), 24–34. https://www.researchgate.net/publication/320264481_Medicinal_plants_for_human_health_and_welfare

[34] Marecik, N. (2007). Traditional societies in East Africa use wild plants for different purposes and means to survive. In H. O. Kay (Ed.), *Promotion of public health care using African indigenous knowledge systems and implications for IPRs: Experiences from Southern and Eastern Africa (ATPS Special Paper Series No. 30).* African Technology Policy Studies Network.

[35] Matos, L. C., Machado, J. P., Monteiro, F. J., & Greten, H. J. (2021). Understanding traditional Chinese medicine therapeutics: An overview of the basics and clinical applications. *Healthcare, 9*(257). https://doi.org/10.3390/healthcare9030257

[36] Mayo Foundation for Medical Education and Research (MFMER). (2022, September 15). High blood pressure (hypertension). *Mayo Clinic*. https://www.mayoclinic.org/diseases-conditions/high-blood-pressure/symptoms-causes/syc-20373410

[37] Mendoza, J., Lasco, G., Renedo, A., Palileo-Villanueva, L., Seguin, M., Palafox, B., Amit, A., Pepito, V., McKee, M., & Balabanova, D. (2022). Deconstructing 'therapeutic itineraries' of hypertension care: A qualitative study in the Philippines. *Social Science & Medicine, 300*, 114570. https://doi.org/10.1016/j.socscimed.2021.114570

[38] Okigbo, R. N., Anuagasi, C. L., & Nnoli, C. N. (2019). Ethnobotanical uses of medicinal plants for the control of diabetes and hypertension. *Journal of Community Preventive Medicine, 2*(1), 1–10. https://asclepiusopen.com/journal-of-community-and-preventive-medicine/volume-2-issue-1/3.pdf

[39] Orillo, M. (2018, April 14). 1 in 4 Filipinos are hypertensive. *The Manila Times*. https://www.manilatimes.net/2018/04/14/business/health-industry/1-in-4-filipinos-are-hypertensive/392420/

[40] Patel, V. (1995). Explanatory models of mental illness in sub-Saharan Africa. *Social Science & Medicine, 40*, 1291–1298.

[41] *Philippine Health Insurance Corporation*. (2019). Sagot ng Philhealth sa diabetes mellitus with coma or ketosis. [Facebook]. https://www.facebook.com/PhilHealthOfficial/photos/a.261644413900245/2396062133791785/?type=3

[42] *Philippine Statistics Authority*. (2016, December 29). Highlights on household population, number of households, and average household size of the Philippines (2015 Census of Population). https://psa.gov.ph/content/highlights-household-population-number-households-and-average-household-size-philippines

[43] Planta, M. (2017*). Traditional medicines in the colonial Philippines 16th-19th century*. University of the Philippines Press.

[44] *Provincial Government of Bulacan*. (2022). About Bulacan: Location and physical profile. https://bulacan.gov.ph/general-info/about-bulacan/

[45] Republic Act No. 8243 (1997). An act creating the Philippine institute of traditional and alternative health care to accelerate the development of traditional and alternative health care in the Philippines, providing for a traditional and alternative health care development fund and for other purposes. *The LawPhil Project*. https://lawphil.net/statutes/repacts/ra1997/ra_8423_1997.html

[46] Sato, A. (2013). Revealing the popularity of traditional medicine in light of multiple resources and outcome measurements from a user's perspective in Ghana. *Health, Policy, and Planning, 27*(8), 625–637.

[47] Sison, J., Divinagracia, R., & Nailes, J. (2020). Asian management of hypertension: Current status, home blood pressure, and specific concerns in the Philippines. *National Library of Medicine*. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8030094/

[48] Sofowora, A., Ogunbodede, E., & Onayade, A. (2013). The role and place of medicinal plants in the strategies for disease prevention. *African Journal of Traditional, Complementary and Alternative Medicines, 10*(5), 210–229. https://doi.org/10.4314/ajtcam.v10i5.2

[49] Subudhi, A. (2023, April 1). Modern drugs: The benefits and adverse effects. LinkedIn. https://www.linkedin.com/pulse/modern-drugs-benefits-adverse-effects-aman-kumar-subudhi

[50] Sullivan, M. A. (2016). Cultural heritage and new media: A future for the past. The John Martial Marshall Review of Intellectual Property Law. https://repository.law.uic.edu/cgi/viewcontent.cgi?article=1392&context=ripl

[51] Tan, G. (2015). Diabetes care in the Philippines. *Annals of Global Health, 81*(6), 863–900. https://doi.org/10.1016/j.aogh.2015.10.004

[52] Tan, M. (2008). *Revisiting usog, pasma, kulam*. University of the Philippines Press.

[53] Ozemek, C., Laddu, D., Arena, R., & Javie, C. (2018). The role of diet for prevention and management of hypertension. *National Library of Medicine, 33*(4), 388–393. https://doi.org/10.1097/HCO.0000000000000532

[54] Raynor, D. K., Dickinson, R., Knapp, P., Long, A., & Nicolson, D. (2011). Buyer beware? Does the information provided with herbal products available over the counter enable safe use? *BMC Medicine, 9*(94), 1–17. https://doi.org/10.1186/1741-7015-9-94

[55] Von Wolputte, S., & Devisch, R. (2002). *Medical pluralism and lay therapy management in Kinshasa, Congo.* Uppsala University (Uppsala-Leuven Research in Anthropology (ULRiCA)).

[56] Wagner, A., Valera, M., Graves, A., Laviña, S., & Ross-Degnan, D. (2008). Costs of hospital care for hypertension in an insured population without an outpatient medicines benefit: An observational study in the Philippines. *BMC Health Services Research, 8*(161), 1–8. https://doi.org/10.1186/1472-6963-8-161

[57] Williams, N. (2021, August 23). Herbal versus synthetic medicines. *News Medical & Life Sciences.* https://www.news-medical.net/health/Herbal-versus-Synthetic-Medicines.aspx

[58] Willcox, M., Elugbaju, C., Al-Anbaki, M., Lown, M., & Graz, B. (2021). Effectiveness of medicinal plants for glycaemic control in type 2 diabetes: An overview of meta-analyses of clinical trials. *Frontiers in Pharmacology, 12*(77561). https://doi.org/10.3389/fphar.2021.777561

[59] World Health Organization. (2023). *Hypertension*. https://www.who.int/news-room/fact-sheets/detail/hypertension

[60] Yolanda, S., Purwati, D., Sulistiawati, & Saputra, P. (2022). The roles of social media in hypertension management programs. *Cermin Dunia Kedokteran, 49*(8), 469–473. https://doi.org/10.55175/cdk.v49i8.291

[61] Zhang, R., Verzelen, K., Tsobou, R., Vanhove, W., Nguetsop, V. F., & Damme, P. V. (2022). Ethnomedicinal study of plants used for treatment of diabetes, hypertension and cardiovascular ailments in Fokoue and Santchou Subdivisions, Menoua Division of West Cameroon. *European Journal of Medicinal Plants, 33*(5), 12–30. https://doi.org/10.9734/ejmp/2022/v33i530464