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MEDICINAL PLANT SPECIES OF THE FAMILY APIACEAE USED IN TRADITIONAL HEALTHCARE IN DISTRICT QUETTA, BALOCHISTAN

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Apiaceae, ethnobotany, medicinal plants, traditional healthcare, indigenous knowledge, Quetta, Balochistan, ethnomedicine.

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Abstract

For the treatment of many major and minor diseases, ethnomedicinal plants play a chief role. The work was done in the District Quetta, Balochistan, Pakistan and base to discover the use of therapeutic plants of the family Apiaceae for the cure of different diseases. The information about the ethnomedicinal plants were collected by taking interviews which include open ended, pre listening, semi structure and structured surveys with different groups of ages. Total 150 residents were interviewed during surveys in which 50 were females, 88(, male, and 12 were pansars. They were divided into 3 age groups. The results were 28 calculated by the ethnobotanical incides I.e., FC, RFC, UV, UR and RFC. 20 genera along with 62 species were observed Trachyspermom ammi, Apium graveolens, Daucus carota, Cuminum cyminum Foeniculum vulgare, Coriander sativum, Ferula safoetida, Pastinaca sativa were the most important frequently used plants and common life form of the area of herbs. At the research site it was observed that optical healing of leaves, flowers, seeds were used. Many of the plant species possess properties that could be beneficial in developing treatments for cancer and cardiovascular diseases. Coriander sativum (19), Daucus carota (17), Cuminum cyminum (15) and Trachospermum Ammi (13) have the highest FC value and Seme novia cardicians. Hydro cotyle thoriodes, Heracleum pinnatum, Angelica gluca, Apium decumben, and Ammi huni (1 for each) has least FC. Foeniculum vulgare (8). Trachyspermum roxburghianum, Daucus carota and Apium graveolens (7 for each) have the highest UR and Hydrocotyle umbellata, Ferula yarchkeana, Angelica oeadum, Carum carvi, Begelly sativa, Apium lobotomy (1 for each) have the least UR value. For the plants Coriander sativum (9.5) have the highest UV value and Heracleum pinnatum, Scandix pecten veneris. Semenovia candicans (0.5 for each) have the least UV value. The analysis of RFC values reveals some interesting findings. Coriander sativum stands out with the highest recorded value of 0.12, while Anethum graveolens, Heracleum canescens, and Apium hatianicum all share a lower value of 0.1. The analysis of ICF values shows a clear distinction between various conditions. Arthritis, the mation, gaut, and Diuretic diseases all received the highest rating of 1, while vomiting and plague scored the lowest at 0.4. For the cure of many diseases Trachyspermum Ammi is used more abundantly. The Apiaceae family provides

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a wide range information of medicines. It is suggested that this subject should be entered in the educational programming section. More and more pharmaceutical investigations in Quetta District are important to disclose the plants natural medication through ethnobotanical as well as molecular studies can be done. The study gives baseline data on recording and conserving traditional knowledge on Apiaceae herbs of Quetta and their use in future phytochemical, pharmacological and drug-discovery studies is suggested.

Introduction

Ethnobotany is part of the discipline of ethnobiology, which concerns with the dynamic relationships among peoples, biota and environments (Ethnobiology Working Group 2003). The term 'ethnobotany' was first used in 1895 by the American botanist John William Harshberger, but the discipline of ethnobotany dates back long before the term was introduced, e.g. the Greek Pedanius Dioscorides of Anazarbus wrote about the useful plants from the Mediterranean he collected in the book *De Materia Medica* (Pardo de Santayana *et al.*, 2010). Harshberger defined ethnobotany as 'the use of plants by aboriginal people'. Since Harshberger's time, the definition of ethnobotany has evolved to include both anthropology and botany: 'studying the dynamic relation between people and plants' (Martin, 1995).

The fast current globalization has led to lifestyle changes which can lead to big losses of traditional knowledge (Cámara-Leret *et al.*, 2014). The multidisciplinary nature of ethnobotany makes it the perfect tool to collect rapidly disappearing traditional knowledge, e.g. from local people in the Amazon rainforest. Next to ensuring traditional knowledge does not get lost, ethnobotanical research helps showing the needs and priorities of local people when new systems or policies for biodiversity conservation or management strategies are developed (Beltrán-Rodríguez *et al.*, 2014). Ecosystems, like the Amazon rainforest, provide local people with goods and services like food, shelter, medicine, energy, etc etc (De-la-Cruz *et al.*, 2007).

Traditional herbal remedies provide health services even in highly industrialized setups because they are important pillars of culture and human socialization (Owuor et al., 2005). In many cases, plants used as herbal remedies are not only important as drugs but also as food supplements with vitamins and minerals (Duke, 1992). Kokwaro (1983) noted that traditional medicine men and women have continued to occupy an important position in our societies. From a social imension, they are used as a tool to determine the efficacy of indigenous medicine. This is reflected in the fact that the community refers patients with particular ailments to specific practitioners (Kaendi, 1997). The change in lifestyles has had a negative impact on maintaining traditional knowledge on herbal remedies, hence there is a danger of this knowledge being lost. There is a rapid loss of traditional herbalists and a decline in authentic knowledge in traditional treatment, as a result of death of many aged healers (Cox and Balick, 1994). Overgrazing and over exploitation of plant resources have already led to a decline of the plant material available (Bussman et al., 2006).

With the advent of "modern medicine" and disinterest which many people from the third world countries show towards herbal remedies, there is danger that the knowledge of traditional healers will be lost forever if action is not taken to document the particular prescriptions involved. In view of the rapid loss of natural habitats, traditional community life, cultural diversity and knowledge of medicinal plants, documentation of African traditional plants is an urgent matter (Wyk et al., 2002). Attempts were recently made to address this knowledge gap for instance: Jeruto et al. (2008) documents medicinal plants used by the Nandi of Kenya, Owuor and Kisangau (2006) made a comparison of plants used in snake bite treatments by two culturally distinct groups (Luo and Kamba), the ethnobotanical data suggests that plant species used by the two ethnic groups are similar though independently derived. Owuor et al. (2005) identified anddocumented 24 plant

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species used by traditional practitioners among the Luo for treatment of snakebites. However, practitioners seem not open and readily willing to disclose plants consistently used in snakebite treatment. This observation requires further documentation comparison of ethno-botanical results (Owuor and Kisangau 2006).

Since ancient times this province is denoted as a hot spot for the production of medicinal plants. Ethnobotanical studies on medicinal flora are crucial for developing novel drugs based on traditional knowledge of the local people (Vitalini et al., 2013). The usage of medicinal plants for medicinal and therapeutic purposes has been studied and documented globally (Shah and Rahim, 2017). Wide list of medicinal herbaria have been established on the study of the medicinal plants but unfortunately no systemic studies have been conducted to preserve this natural wealth and conserve the same. The role of herbal treatment in curing various diseases is vital because of the fact that a large number of ailments are cured by plant based medications (Rehecho et al., 2011). In this context ethnobotanical researches demonstrate high significance and prominence of medicinal plants in cognitive pluralistic perspective. Such studies not only play an important role in upgrading the social status and economic values of an area but also preserve the aboriginal medico-ethnobotanical data of the indigenous communities that consequently preserve the global heritage (Sanz-Biset et al., 2009). Medicinal plants are considered very important among the rural communities due to their potential to cure health related problems for which several of remote communities are unreachable of modern health care facilities (Verma and Singh, 2008). Out of approximately 6000 plants species in Pakistan 600 to 700 are reported to have medicinal value. In Balochistan the use of allopathic and other medicinal drugs is not as old as is the case of other parts of the country. Among them 456 plants species are used in the formulation of approximately 350 synthetic drugs (Ahmad and Husain, 2008).

Pakistan has variations on climatic conditions, ecological zones and topography where diverse flora of medical importance flourishes in dry to temperate habitats. Limited number of ethnobotanical expeditions have been conducted in well-known valleys of Pakistan (Ahmad et al., 2014) but most of the remote valleys are still unexplored There could be hundreds of plant species growing in these valleys having medicinal, industrial and economic potential. Local communities of various regions use these species in different ways on the basis of their cultural beliefs and inherited experience. However, little attention is being paid to the conservation and sustainable utilization of several of potential species. Salt Range of Pakistan is one of such region which is least explored regarding the documentation of medicinal wealth present in several of its valleys.

The province of Baluchistan is among the most fascinating area awaiting systematic study of its ethnobotanical knowledge associated with native flora of the region. Recently (Shah et al., 2018) has documented sixty eight (68) medicinal plants used in snakebite and scorpion sting used by the inhabitants of this valley who are predominantly pastoralists, peasants and farmers. Namal Valley is naturally gifted with diverse flora with social, economic and environmental importance. The objectives of this study were to collect record and document information regarding the plants used ethnobotanically by the aboriginal people especially with respect to the medicinal wealth of the plants. This extensive study carried out throughout the Valley revealed an exhaustive list profile of medicinal plants, based on quantitative evaluations adopting several ethnobotanical indices like use value (UV), frequency of citation (FC), relative frequency citation (RFC), family importance value (FIV), informant consensus factor (ICF) and the Jaccard index (JI). Even present day scenario shows that hardly a few medicine shops have been established in the big cities and rest of the population still depends on the natural medicinal herbs in its actual or extract form. Review of literature shows that only three to four districts i.e. Ziarat, Mastung, Kalalt have been enlisted on the study of medicinal plants. In an honest approach the attention that ought to have been given in this field has not been given.

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Further, survey of research on medicinal plants shows that only few plants grown in these districts have been given just a cursory touch. There is lot of room for exploration and conducting research in this neglected field and area. Whole the world is paying considerable attention and installing new and new pharmaceutical industries on the drugs development derived from the field of medicinal plants. Not the people of Baluchistan because of non availabilityof technicalknowledge are using medicinal plants but main focus of the international research centers is also on the development of drugs having origin from this plant community (Farnsworth and Soejarto, 1991).

Ever since ancient times, in search of rescue for disease, people looked for drugs in nature (Padula*et al.*,1999. The beginnings of the medicinal plants' use were instinctive, as is the case with animals. In view of the fact that at the time, there was not sufficient information either concerning the reasons for the illnesses or concerning which plant and how it could be utilized as a cure, everything was based on experience (Akerele, 1992). In time, the reasons for the usage of specific medicinal plants for the treatment of certain diseases were being discovered; thus, the medicinal plants' usage gradually abandoned the empiric framework and became founded on explicatory facts. Until the advent of iatrochemistry in 16th century, plants were the source of treatment and prophylaxis. Nonetheless, the decreasing efficacy of synthetic drugs and the increasing contraindications of their usage make the usage of natural drugs topical again (Fransworth, 1992).

According to Sumner (2000) medicinal plants, also called medicinal herbs, botanical drugs, or natural product drugs, have been discovered and used in traditional medicine practices since prehistoric times. Plants synthesize hundreds of chemical compounds for botanical functions, including defense against insects (Moulds and McNeil, 1988), fungi (Sandberg and Corrigan, 2001), diseases, and herbivorousmammals (Shankar and Liao 2004). Numerous phytochemicals with potential or established biological activity have been identified (Schulz *et al.*, 2001). However, since a single plant contains widely diverse phytochemicals, the effects of using a whole plant as medicine are uncertain (Tyler, 2000). Further, the phytochemical content and pharmacological actions, if any, of many plants having medicinal potential remain unassessed by rigorous scientific research to define efficacy and safety (Zhang, 1998). In the United States over the period 1999 to 2012, despite several hundred applications for new drug status, only two botanical drug candidates had sufficient evidence of medicinal value to be approved by the Food and Drug Administration (Therapeutic Goods Administration, 1999). The earliest historical records of herbs are found from the Sumeriancivilization, where hundreds of medicinal plants including opium are listed on clay tablets. The Ebers Papyrus from ancient Egypt describes over 850 plant medicines, while Dioscorides documented over 1000 recipes for medicines using over 600 medicinal plants in *De materiamedica*, forming the basis of pharmacopoeias for some 1500 years. Drug research makes use of ethnobotany to search for pharmacologically active substances in nature, and has in this way discovered hundreds of useful compounds. These include the common drugs aspirin, digoxin, quinine, and opium. The compounds found in plants are of many kinds, but most are in four major biochemical classes: alkaloids, glycosides, polyphenols, and terpenes(Zhu, 1998).

Medicinal plants are widely used in non-industrialized societies, mainly because they are readily available and cheaper than modern medicines. The annual global export value of 50,000 to 70,000 plants with suspected medicinal properties was estimated to be US$2.2 billion in 2012(Agrawal,2018), and in 2017, the potential global market for botanical extracts and medicines was estimated at several hundred billion dollars. In many countries, there is little regulation of traditional medicine, but the World Health Organization coordinates a network to encourage safe and rational usage. Medicinal plants face both general threats, such as climate change and habitat destruction, and the specific threat of over-

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collection to meet market demand(Balick and Cox 1997).

The depletion of elements of traditional knowledge, like languages or material aspects of a culture (e.g. instruments), but also losses in ecosystems, biodiversity, natural resources, soils, etc. are all influenced by drivers of change (Foley *et al.*, 2007; Fujisaka *et al.*, 2000). Losses of natural resources can result in less food security, medicinal plants, etc., leading to impoverishment of local people (Foley *et al.*, 2007; Murray, 2006). Drivers of change can be deforestation, logging, overexploitation, etc. Deforestation is a shift in land-use, i.e. conversion of forest to another land-use practice like agricultural land. With logging there is no land-use change, it is the selective extraction of timber trees causing major changes for the environment (Millenium Ecosystem Assessment 2005; Sasaki *et al.*, 2009). These drivers of change influence the natural environment and can have big consequences on numerous aspects of the ecosystem (Foley *et al.*, 2007). Plants, used as culinary herbs and spices, have been used as medicines, not necessarily effectively, from prehistoric times. Spices have been used partly to counter food spoilage bacteria, especially in hot climates,and especially in meat dishes which spoil more readily (Lovkova*et al.*, 1989).Angiosperms (flowering plants) were the original source of most plant medicines. Human settlements are often surrounded by weeds used as herbal medicines, such as nettle, dandelion and chickweed.Humans were not alone in using herbs as medicines: some animals such as non-human primates, monarch butterflies and sheep ingest medicinal plants when they are ill. Plant samples from prehistoric burial sites are among the lines of evidence that Paleolithic peoples had knowledge of herbal medicine. For instance, a 60 000-year-old Neanderthal burial site, "Shanidar IV", in northern Iraq has yielded large amounts of pollen from 8 plant species, 7 of which are used now as herbal remedies.A mushroom was found in the personal effects of *Ötzi the Iceman*, whose body was frozen in the Ötztal Alps for more than 5,000 years. The mushroom was probably used against whipworm (Sultana, 2014 and Capasso, 1998).

In ancient Sumeria, hundreds of medicinal plants including myrrh and opium are listed on clay tablets. The ancient EgyptianEbers Papyrus lists over 800 plant medicines such as aloe, cannabis, castor bean, garlic, juniper, and mandrake.From ancient times to the present, Ayurvedic medicine as documented in the Atharva Veda, the Rig Veda and the Sushruta Samhita has used hundreds of pharmacologically active herbs and spices such as turmeric, which contains curcumin.The Chinese pharmacopoeia, the *Shennong Ben Cao Jing* records plant medicines such as chaulmoogra for leprosy, ephedra, and hemp.This was expanded in the Tang Dynasty*YaoxingLun*. In the fourth century BC, Aristotle's pupil Theophrastus wrote the first systematic botany text, *Historiaplantarum*. During century AD, the Greek physician PedaniusDioscorides has documented over 1000 recipes for medicines using over 600 medicinal plants in *De materiamedica*; it remained the authoritative reference on herbalism for over 1500 years, uptoill century (Pan et al., 2014).

In the Early Middle Ages, Benedictine monasteries preserved medical knowledge in Europe, translating and copying classical texts and maintaining herb gardens. Hildegard of Bingen wrote *Causae et Curae* ("Causes and Cures") on medicine. In the Islamic Golden Age, scholars translated many classical Greek texts including Dioscorides into Arabic, adding their own commentaries. Herbalism flourished in the Islamic world, particularly in Baghdad and in Al-Andalus. Among many works on medicinal plants, Abulcasis (936–1013) of Cordoba wrote *The Book of Simples*, and Ibn al-Baitar (1197–1248) recorded hundreds of medicinal herbs such as *Aconitum*, nux vomica, and tamarind in his *Corpus of Simples*. Avicenna included many plants in his 1025 *The Canon of Medicine*. Abu-RayhanBiruni, Ibn Zuhr, Peter of Spain, and John of St Amand wrote further pharmacopoeias(Brater& Daly, 2000).

The Early Modern period saw a flourish of illustrated herbals across Europe, starting with the 1526 *Grete Herball*. John Gerard wrote his famous *The Herball or General History of Plants* in 1597, based on Rembert Dodoens, and Nicholas Culpeper published his *The English Physician*

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Enlarged. Many new plant medicines arrived in Europe as products of Early Modern exploration and the resulting Columbian Exchange, in which livestock, crops and technologies were transferred between the Old World and the Americas in the 15th and 16th centuries. Medicinal herbs arriving in the Americas included garlic, ginger, and turmeric; coffee, tobacco and coca travelled in the other direction.In Mexico, the sixteenth century *Badianus Manuscript* described medicinal plants available in Central America(Gimmel, 2008).

The position of plants in medicine was radically altered in the 19th century by the application of chemical analysis. Alkaloids were isolated from a succession of medicinal plants, starting with morphine from the poppy in 1806, and soon followed by ipecacuanha and strychnos in 1817, quinine from the cinchona tree, and then many others. As chemistry progressed, additional classes of pharmacologically active substances were discovered in medicinal plants.Commercial extraction of purified alkaloids including morphine from medicinal plants began at Merck in 1826. Synthesis of a substance first discovered in a medicinal plant began with salicylic acid in 1853. Around the end of the 19th century, the mood of pharmacy turned against medicinal plants, as enzymes often modified the active ingredients when whole plants were dried, and alkaloids and glycosides purified from plant material started to be preferred. Drug discovery from plants continued to be important through the 20th century and into the 21st, with important anti-cancer drugs from yew and Madagascar periwinkle (Bhat, 1995).

A medicinal plant is a plant that is used to to maintain health, to be administered for a specific condition, or both, whether in modern medicine or in traditional medicine. The medicinal plants may prevent or treat various diseases through exerting antioxidant and anti-inflammatory properties. Our surrounding nature and the flora of various regions is full of plant species with unknown pharmaceutical and therapeutic properties and discovering their properties may take a long time, then ethno-botany is useful because of transforming the pharmaceutical culture and herbal medicine of any regions from oral into a written one (Gholami-Ahangaran, 2012.). The people of different cultures and nations worldwide, particularly in Iran, China, Egypt, and Greece, have been assumed, chemical drugs are efficient to improve disease and expedite this process, however, medicine has been advancing and any chemical drugs, alongside therapeutic properties, have been demonstrated to cause side effects, the people have opted to use the medicinal herbs with minimal side effects (Saki, 2014). The documentation of knowledge of medicinal plants serves as a baseline data for future phytochemical and pharmacological studies. The Food and Agriculture Organization estimated in 2002 that over 50,000 medicinal plants are used across the world.The Royal Botanic Gardens, Kew more conservatively estimated in 2016 that 17,810 plant species have a medicinal use, out of 30,000 plants for which a use of any kind is documented (Barboza et al.,2009).

Apiaceae (Umbelliferae) family is one of the biggest plant families on the earth. This province has a huge diversity of Apiaceae members. This family possesses a range of compounds that have many biological activities. The members of this family are well known as vegetables, culinary and medicinal plants. The study undertaken aimed at to present a review of ethnobotanical uses of Apiaceae plants by the our people in order to provide a comprehensive documentation for future investigations. This family includes 434 genera and about 3700 species. Apiaceae was first described by John Lindleyin 1836. This family possesses a range of compounds that have many biological activities. The members of this family are well known as vegetables, culinary and medicinal plants. It is the 16th-largest family of flowering plants including such well-known and economically important plants such as angelica, anise, asafoetida, caraway, carrot, celerychervil, coriander, cumin, dill, fennel, hemlock, lovage, cow parsley, parsley, parsnip. Apiaceae or Umbelliferae, is a family of mostly aromatic flowering plants. The name is derived from the type genus Apium. The family, Umbelliferae, derives from the inflorescence being generally in the form of a compound umbel. Many members

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of this family are cultivated for various purposes that are large enough to be useful as food. Many species produce essential oils in their leaves or fruits. The seeds may be used in cuisine. Several plants of the Apocynaceae family members have had economic uses in the past. The family is most abundant in the northern hemisphere, though can be found worldwide. Botanically, the Apiacea family has been organised and categorized in different ways over the last several centuries. One such classification system breaks the family into 3 subfamilies. The Apioideae, saniculoideae and hydrocotyloideae and then further dividing these into a series of tribes and subtribes.

In modern medicine, around a quarter of the drugs prescribed to patients are derived from medicinal plants, and they are rigorously tested. In other systems of medicine, medicinal plants may constitute the majority of which, often informal attempted treatments, not tested scientifically. The World Health Organization estimates, without reliable data, that some 80 percent of the world's population depends mainly on traditional medicine (including but not limited to plants); perhaps some two billion people are largely reliant on medicinal plants.[35][38] The use of plant-based materials including herbal or natural health products with supposed health benefits, is increasing in developed countries. This brings attendant risks of toxicity and other effects on human health, despite the safe image of herbal remedies.Herbal medicines have been in use since long before modern medicine existed; there was and often still is little or no knowledge of the pharmacological basis of their actions, if any, or of their safety.

The World Health Organization formulated a policy on traditional medicine in 1991, and since then has published guidelines for them, with a series of monographs on widely used herbal medicinesMazid, Khan & Mohammad 2012). Medicinal plants may provide three main kind of health benefits who consume them as medicines,financial benefits who harvest process and distribute them for sale and society-wide benefits such as job opportunities, taxation income and a healthierlabour force. Howeverdevelopment of plants or extracts having potential medicinal uses are blunted by weak scientific evidence, poor practices in the process of drug development and insufficient financing. Despite all these benefits this area of science has been left unattended. It is strongly believed that, this study will help to improve this neglected area of research and shall bring a cogent break through(Ahn, 2017).

MATERIALS AND METHODS

3.1 Study area

District Quetta

Quetta is the provincialcapital and largest city of Balochistan . It is at an average elevation of 1,680 metres (5,510 feet) above sea level, making it Pakistan's only high-altitude major city. The city is known as the "Fruit Garden of Pakistan," due to the numerous fruit orchards in and around it, and the large variety of fruits and dry fruits produced there. Located in northern Balochistan Quetta has a semi-arid climate with a significant variation between summer and winter temperatures. Summer starts about late May and goes on until early September with average temperatures ranging from 24–26 °C (75–79 °F).

The present studies will comprise on in-vivo or field survey. I will collect the information regarding the use of medicinal plants of family Apiaceae from different ethnic groups in Quetta district.The ethnic groups will include local land races of different age groups and both the genders. For the proposed research I will use different type of program like questionnaires, free listening,personal observations and interviews. A questioner air will be developed and circulated among the target population and interview will conduct by herself in the filed area.

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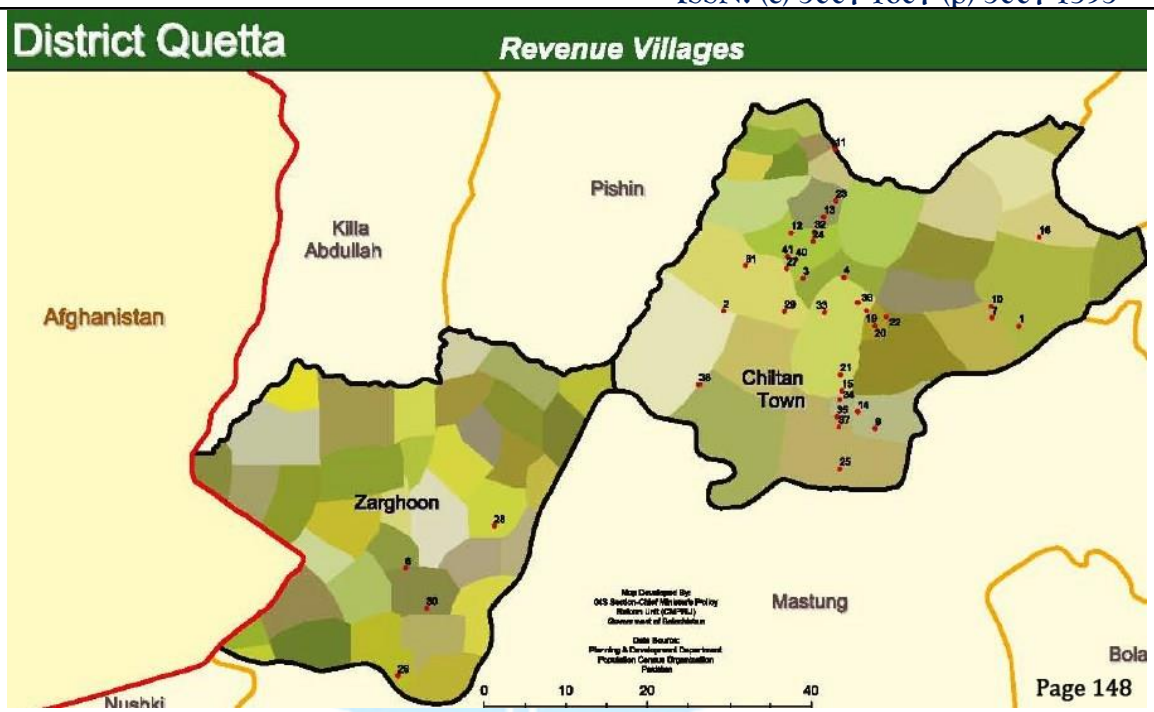


Figure-1.Map of the Quetta District.

3.2 Plants collection and identification

The apicaeae plants fromdifferent areas of Quetta District will be collected and identified for futher study.

Data collection

The medicinal plants collection, identification and deposition during (2018–2019) in district Quetta and its related near by areas covering almost all the seasons of the year and from all the parts of district including deserts like Dashte, HazarGangi,Chiltan National Park, Main gundi, Karkhaza, Hanna urak, Hana lake, Suragurgai, Nawkilli, Spenkaraiz etc. The collected plant specimens were dried and preserved processed as per routine herbarium techniques recommended by(Jain, 1977). . For reconfirmation of plants identification, the Flora of Pakistan (Abbasi et al., 2010) and Ali, (2008) have been consulted. Voucher specimens were deposited in the herbarium of Department of Botany University of Balochistan The data regarding medicinal uses of apicaeae will be colected by Questionnaire.The medicinal plants of apicaeae family will be collected from Quetta District.

Field interviews

Ethnobotanical data was collected throughfield interviews with key informants and free listing interviewswith randomly selected informants and selected after free listing (Ghorbani et al., 2011). The questionnaire was mainly nbased on the claims of ethnobotanical and traditional believes of local society and the related area people. Local languages were used for the interviews will be conducted. For the ethnomedicinal information, a total of 150 inhabitants of the area will be interviewed. 50 women, 70 men and 30 men traditional healers will be interviewed. The informants will bde divided into three different age groups i.e. 61–80, 41–60 and 21–40years old and.

3.3.Quantitative analysis of ethnobotanical data

The collected data will be analyzed using quantitative value indices.

use report (UR) and Use value (UV)

The Use value (UV) demonstrates the relative importance of
plants known locally. It was calculated using the following formula

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(Phillips et al., 1994):

UV ¼ ∑U=n

where U' is the number of use reports cited by each informant for a given plant species and 'n' is the total number of informants interviewed for a given plant.UV is the use value of a species, ' The UV is applied in determining the plants with the maximum use, which most frequently indicated in ailment treatment, while use report (UR) is the use recorded for every species of plant

Informant consensus factor (ICF)

Informant consensus factor (ICF) was calculated by Logan,

1986; Heinrich et al., 1998) using the following formula:

$ICF = (N_{ur} - Nt) / (N_{ur} - 1)$

where N_{ur} stand for the total number of use reports for each diseascategory and $N_t$is the number of taxa used in that category of plant. It is applied to checked the homogeneity of knowledge on the bases of use of species in the skiness categories between the populations. The ICF give a range of (0–1). Maximum ICF exhibit that there is a narrow well defined group of species utilized to cure a specific ailment category or that information is exchanged between informants and low ICF values (close to zero) indicate that informants disagree over which plant to use as lack of exchange of information or because of random choosing or about the use among informants (Gazzaneo et al., 2005).

3.4 Significance of study

This study will provide Knowledge about medicinal use of apicaeae family and will open new door of knowledge for drug discovery and pharmaceuticals. According to best of my knowledge this will be the 1st study about the medicinal uses of plants of family Apiaceae in district Quetta.

3.5.Data Analysis

The data will manage and organize. Data will analyzed on SPS. The data will analyzed through relevant statistical tests and formula as; t-test, one way ANNOVA, frequency, mean score, percentage, standard deviation and value of significance etc.

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Results

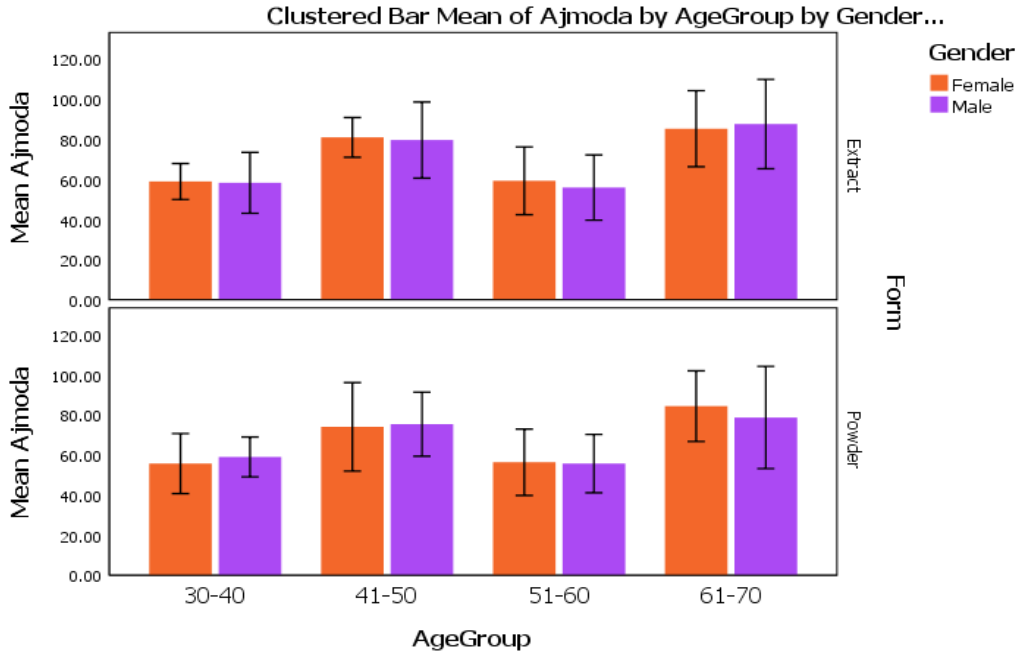


Fig.1 Ajmoda used by different age grop

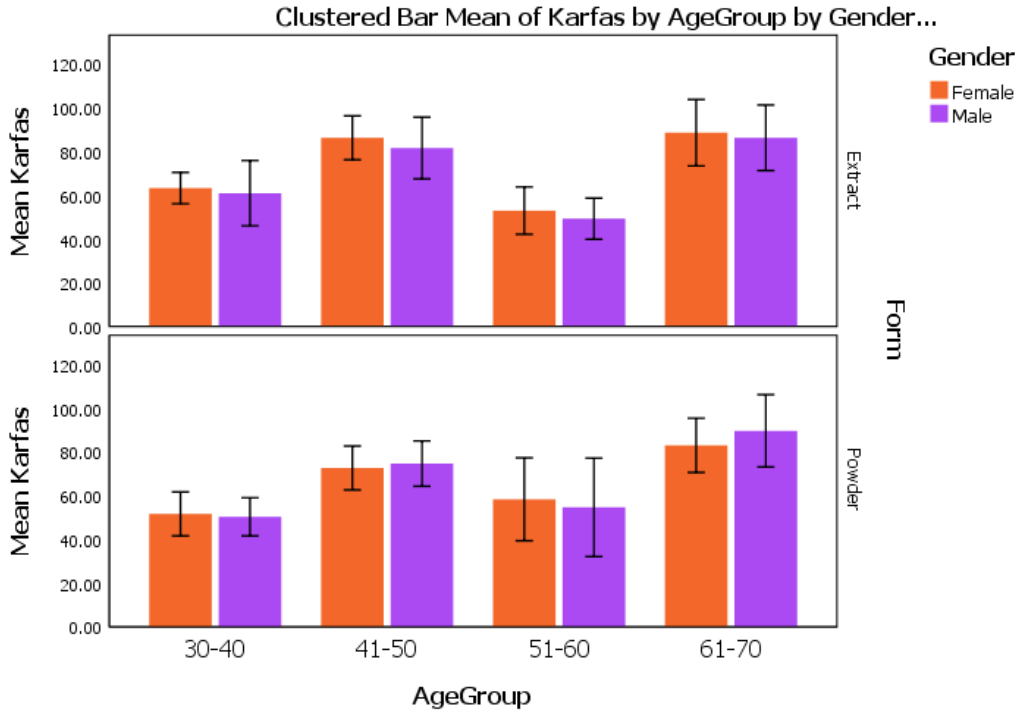


Fig.2 Karfas used by different age grop

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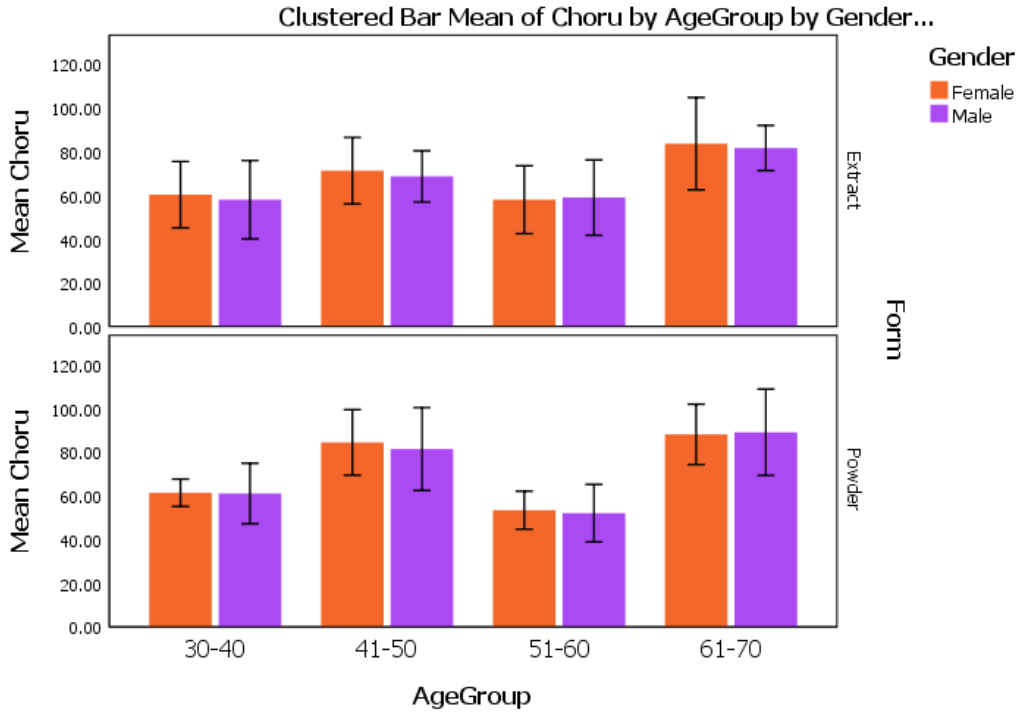


Fig.3 Choru used by different age grop

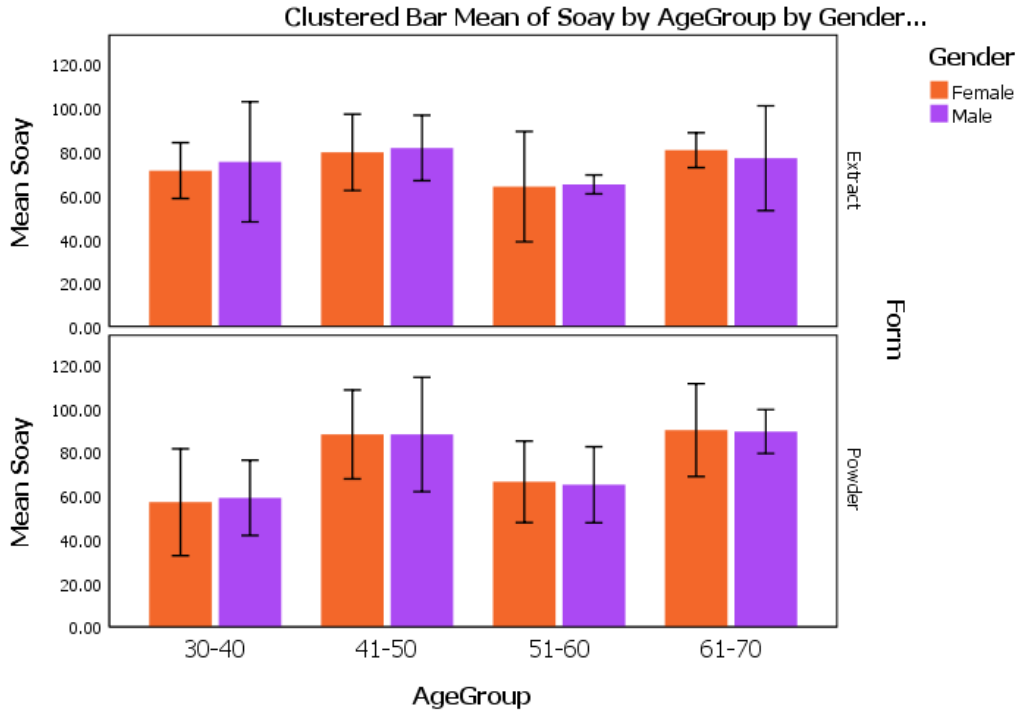


Fig.4Soay used by different age grop

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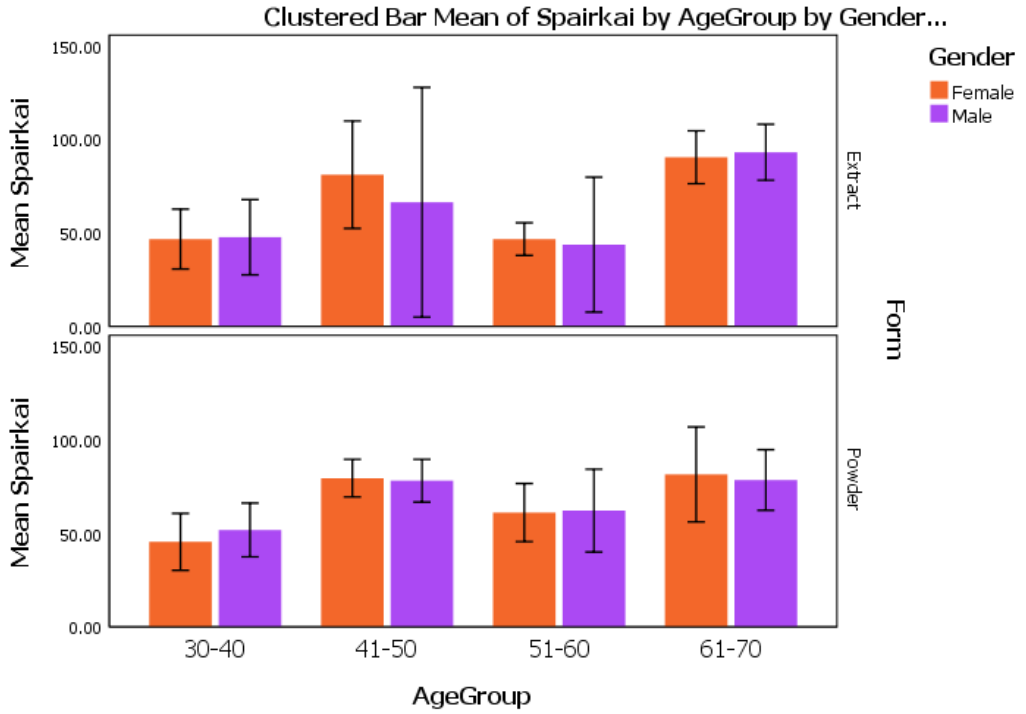


Fig.5 Choru used by different age grop

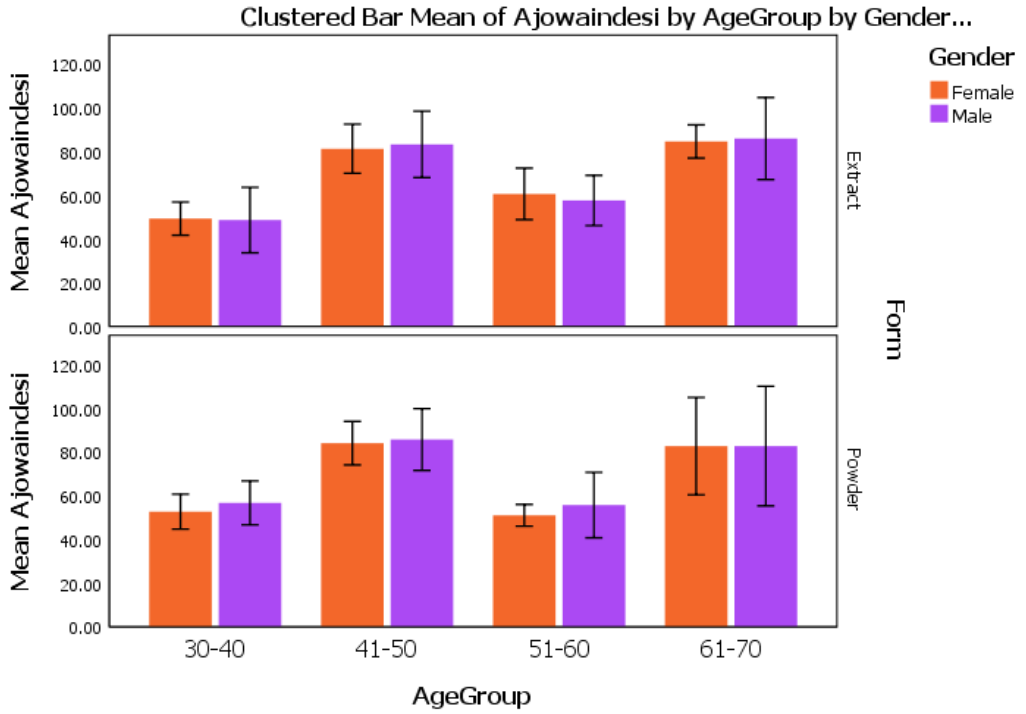


Fig.6.Ajoain dasi used by different age grop

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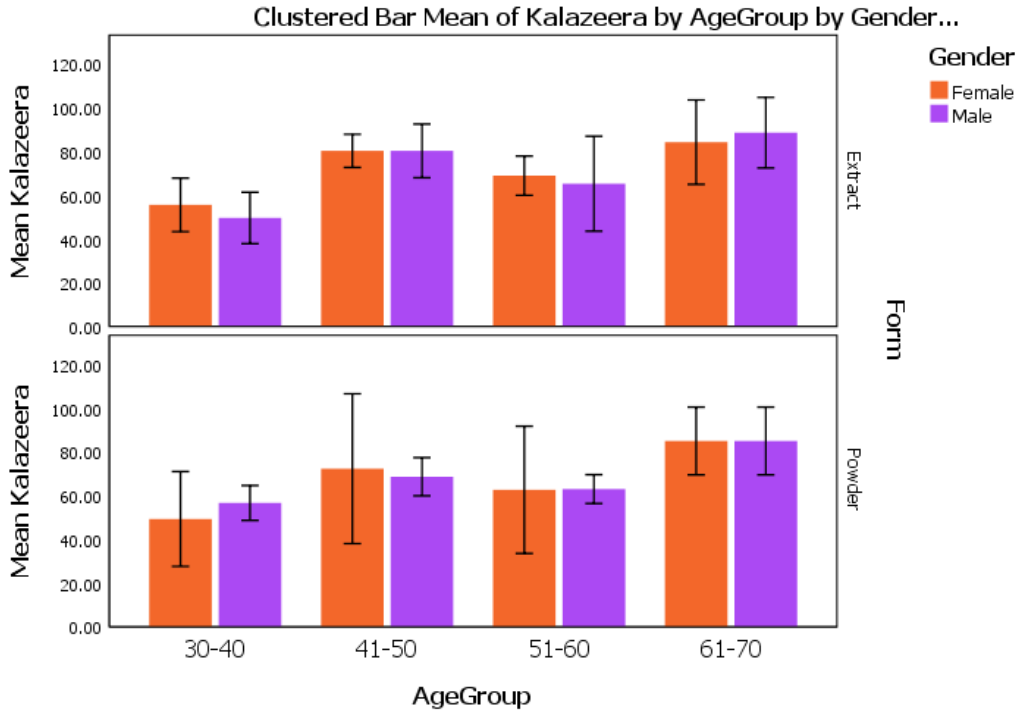


Fig.7 Kalazeera used by different age grop

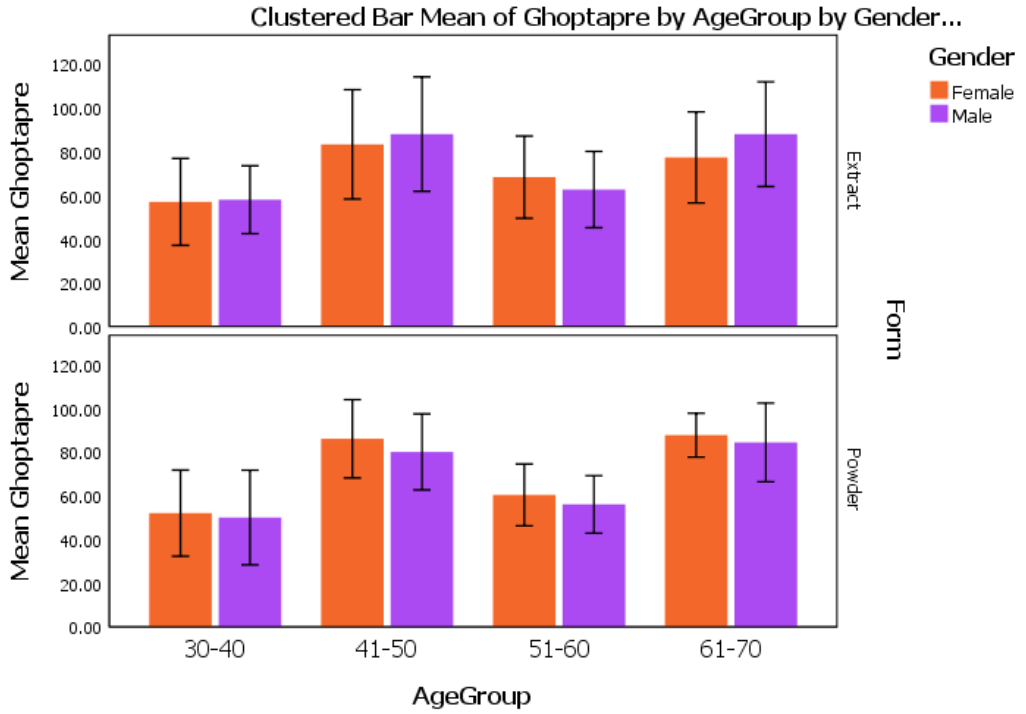


Fig.8 Ghoptapre used by different age grop

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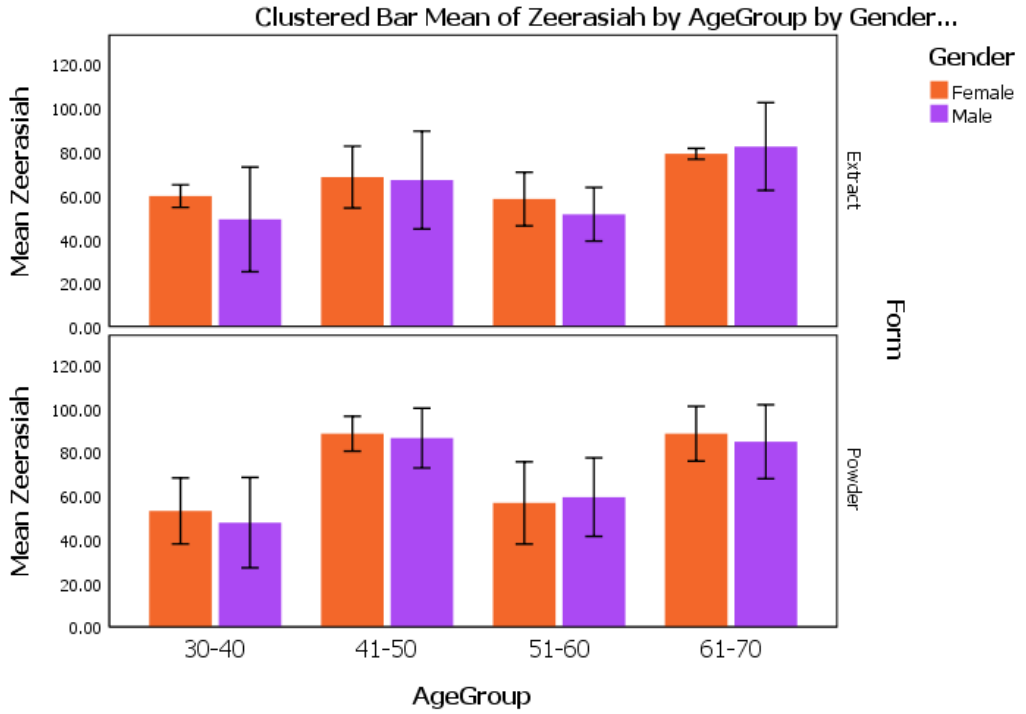


Fig.9 Zeerasiah used by different age grop

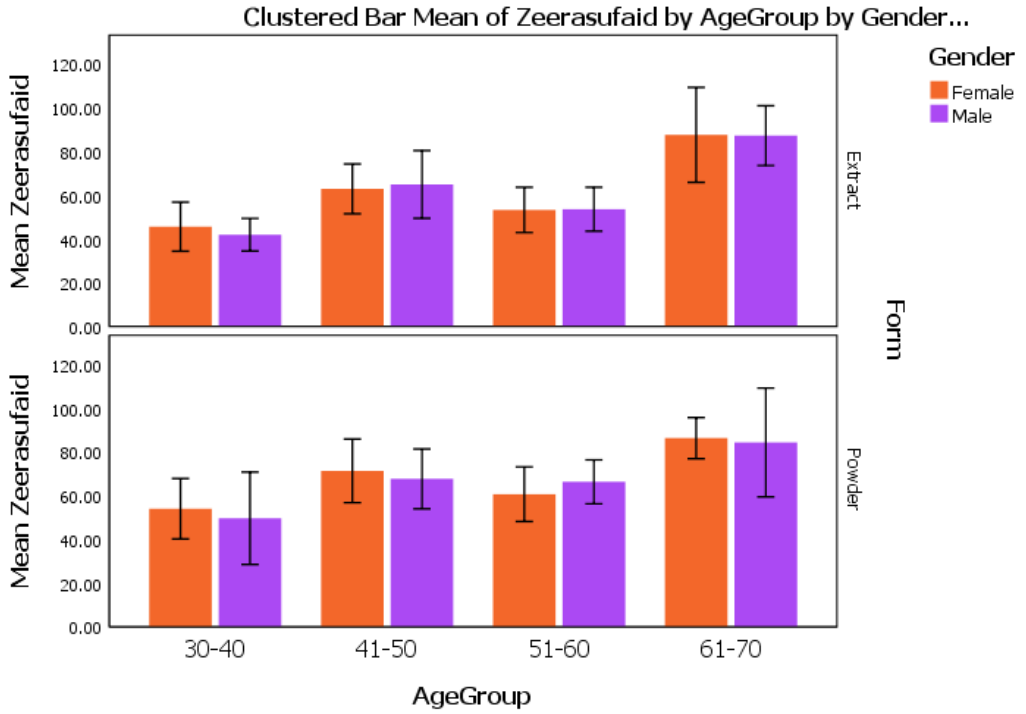


Fig.10 Zeera sufaid used by different age grop

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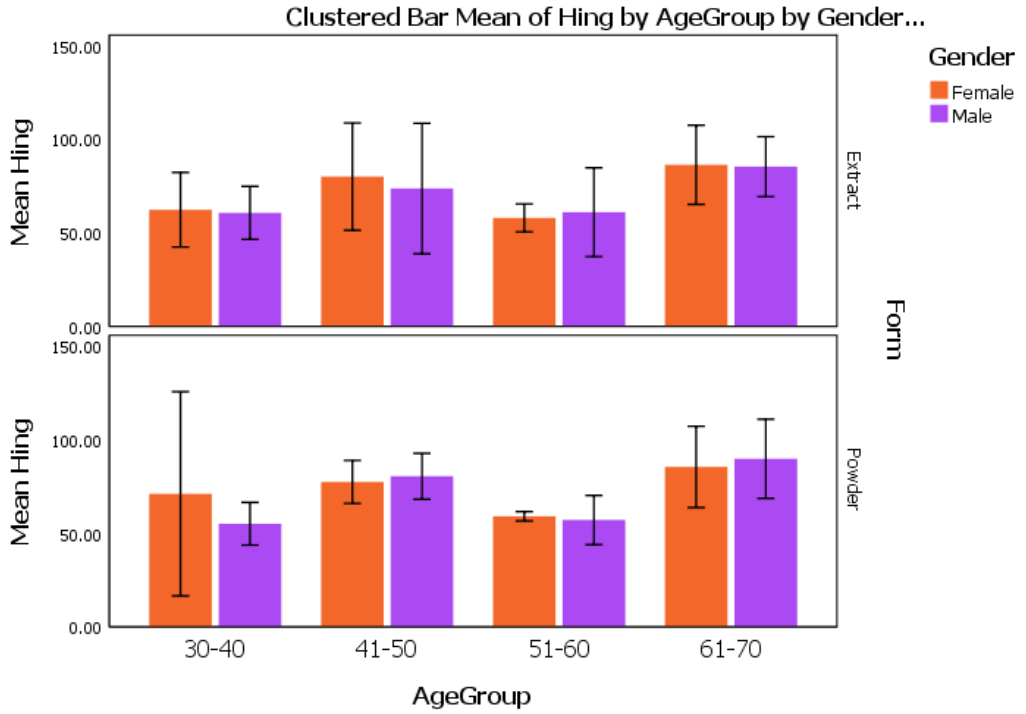


Fig.11 Hing used by different age grop

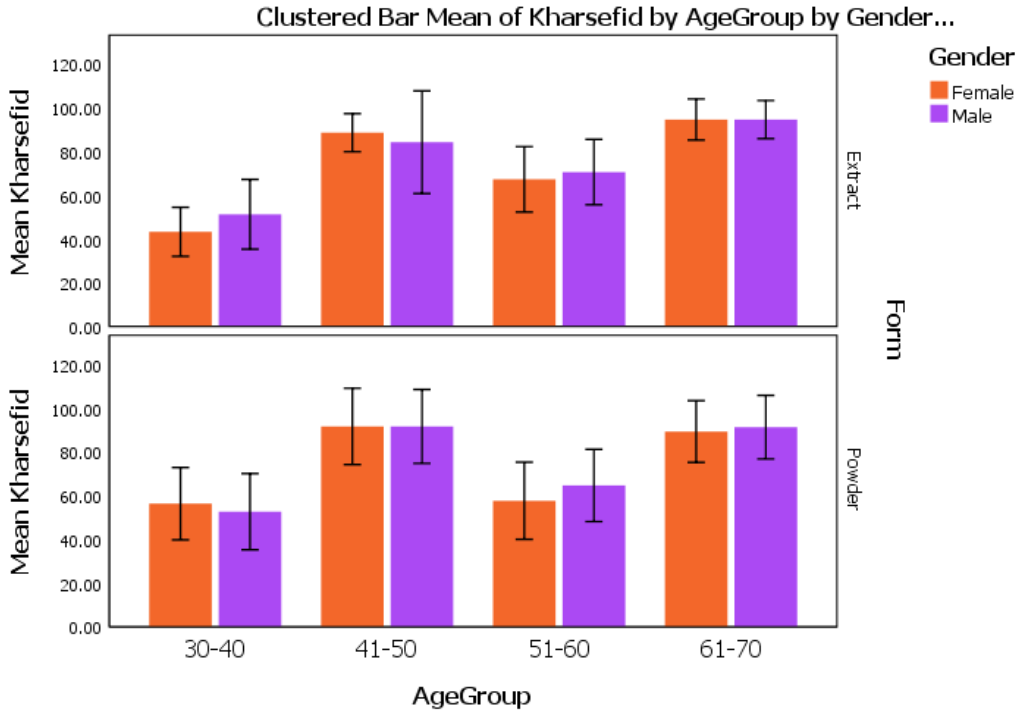


Fig.12 Kharsefid used by different age grop

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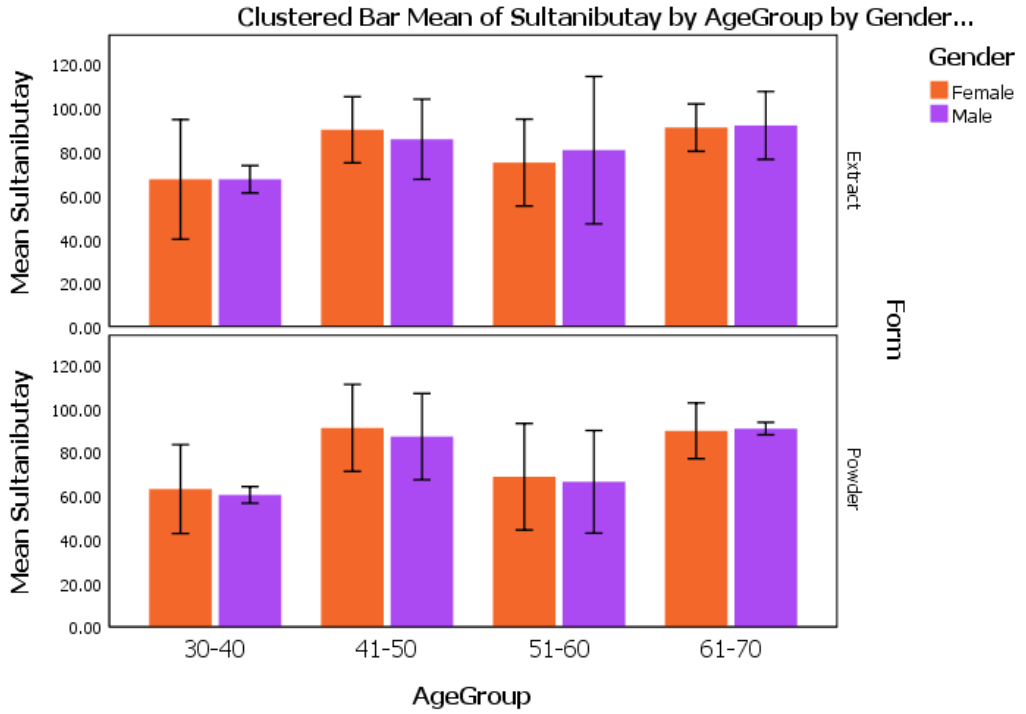


Fig.13 Sultanibuty used by different age grop

Table 1. Demographic information of informants.

Total participants interviewed	**150**
Demographic status	**Percentage**
Gender Female Male Pansar	 **50** **88** **12**
Marital status Married Single	 **120** **30**

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Local Migrant	**115** **35**
Age group Between 21-40 Between 41-60 Between 61-80	 **65** **55** **30**

Table No 2. Medicinal plants of family Apiaceae used by local people of Quetta.

S. #	Botanical Names	English Names	Life Form	Disease Treatment	Preparation method	Distri-bution	FC	UR	UV	RFC
1.	*Trachysperm Ammi* *(L.) Sprague*	Ajwain/caraway	Herb	Blood pressure	Tea	Quetta	13	5	2.6	0.086
2.	*Ammi* crinitum Guss		Herb	Fight bacteria and fungi	Paste	Quetta	2	1	2	0.013
3.	*Ammi huntii* *H.C. Watson*		Herb	Control cholesterol levels	Tea	Quetta	1	2	0.5	0.006
4.	*Ammi topalli* Beauverd		Herb	Infections	Paste	Other city	4	3	1.3	0.026
5.	*Ammi* *Trifoliatum* Trel.		Herb	Digestion	Tea	Quetta	2	4	0.5	0.01

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6.	*Ammi visnaga* H. Wolff		Herb	Cough	Soup	Other city	5	2	2.5	0.03
7.	*Apium graveolens* **L.**	Celery	Herb	Arthritis	Decoction	Quetta	10	7	1.42	0.06
8.	*Apium celleri* Gaertn.		Herb	Rhematio n	Decoction	Quetta	8	3	2.66	0.05
9.	*Apium decumbens* Eckl. & Zeyh.		Herb	Gaut	Powder	Other city	1	1	1	0.006
10.	*Apium laciniatum* (DC.) Urb.		Herb	Congestio n		Other city	2	1	2	0.01
11.	*Apium rapaceum* Mill.		Herb	Lower blood pressure	Park	Other city	3	3	1	0.02
12.	*Apium integrilobum* Hayata		Herb	Combacts peptic	Oil	Other city	2	2	1	0.01
13.	*Apium lobatum* Gilib.		Herb	Ulcer	Powder	Other city	4	1	4	0.02.
14.	*Apium maritimum* Salisb.		Herb	Relieves indigestio n	Decoction	Other city	6	2	3	0.04
15.	*Daucus carota* L.	Gajar	Herb	Reduction of cancer	Water	Quetta	17	7	2.4	0.11
16.	*Daucus abyssinicus* C.A. Mey.		Herb	Cardiovas cular disease	Juice	Quetta	7	3	2.3	0.04
17.	*Foeniculum vulgare* Mill.		Herb	Antiinfla mmatory	Decoction	Quetta	12	8	1.5 0.08	

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18.	*F. azoricum* Mill.		Herb	Weight lose	Broth	Other city	7	2	3.5	0.04
19.	*F. divaricatum* Griseb.		Herb	Anameia	Soup	Other city	3	2	1.5	0.02
20.	*F. vulgare* Mill.		Herb	Intestinal gas	Decoction	Quetta	4	1	4	0.02
21.	*Cuminum cyminum* L.		Herb	Cancer, acute gastristis	Oil	Quetta	15	5	3	0.1
22.	*C. nigrum*		Herb	Heart disease	Broth	Quetta	6	1	6	0.04
23.	*Nigella sativa* L.		Herb	High diabetes	Soup	Quetta	3	1	3	0.02
24.	*Carum carvi* L.		Herb	Dyspepsia		Quetta	4	1	4	0.02
25.	*Anethum graveloens* L.		Herb	Heart disease and strock		Quetta	2	2	1	0.01
26.	*Angelica glauca* Edgew.	Gandrayan	Herb	Dyspepsia, Constipation, Ulcer of palate, dysentery, menorrhagia	Decoction	Quetta	1	1	1	0.006
27.	*Angelica oreada* (Diels) M.Hiroe		Herb	Heart burning, intestinal gas, loss of apepititate, nerverousness, plague, trouble sleeping	Decoction	Quetta	2	1	2	0.01
			Herb	Rhiritis, Sinusitis,	Powder	Other city	5	3	1.6	0.03

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28.	*Centipeda minima* (L.) A. Braun & Asch.	Spreading sneeze weed		Relieving pain, Reducing swelling, Treating cancer						
29.	*Centella asiatica* (L.) Urb.	Indian pennywort s	Herb	Heal wound, skin conditions (leprosy and psoriasis), mental clarity	Paste	Other city	7	2	3.5	0.04
30.	*Chaerophyllum reflexum* Aitch.	Kashmir cherril	Herb	Cough, cold, body pain, anemia		Other city	8	4	2 0.05	0.05
31.	*Chaerophyllum villosum* Wall. ex DC.	Hairy cherril	Small tree	Stomach problems		Other city	6	2	3 0.04	0.04
32.	*Conium maculatum* L.	Poison hemlock	Herb	Anti-cancer		Other city	5	3	1.6	0.03
33.	*Coriandrum sativum* L.	Coriander	Herb	Lower blood sugar, digestion, fight infections		Quetta	19	2	9.5	0.12
34.	*Cortia depressa* (D. Don) Norman	Prostrate cortia	Shrub	Anti-inflammat ory		Quetta	10	6	1.6	0.06
35.	*Ferula jaeschkeana* Vatke	Wild asafoetida	Herb	Hysteria, nervous conditions , bronchitis, asthma, infantile pneumnia		Quetta	3	1	3	0.02
36.			Herb			Quetta	9	2	4.5	0.06

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	Ferula assa-foetida L.			Whooping cough						
37.	*Heracleum canescens* Lindl.	Grey-hairy hog weed	Shrub	Anti-microbial		Other city	2	3	0.6	0.01
38.	*Heracleum pinnatum* C.B. Clarke	Pinnate-leaved hog weed	Shrub	Asthma		Other city	1	2	0.5	0.06
39.	*Hydrocotyle himalaica* P.K. Mukh.	Himlayan pennyworts	Shrub	Anti-carcinogenic		Other city	3	4	0.75	0.02
40.	*Hydrocotyle javanica* Thunb.	Java penny worts	Shrub	Rheumatism		Other city	6	3	2	0.04
41.	*Hydrocotyle sibthorpiodes* Lam.	Water penny worts	shrub	Immune system, asthma		Other city	1	2	0.5	0.006
42.	*Hydrocotyle umbellate* L.	Dollar weeds	Shrub	Skin ulcers		Other city	4	1	4	0.002
43.	*Hymenidium stellatum* (D. Don) Pimenov & Kljuykov	Stary milk parsley	Herb	Cancer, Heart disease		Quetta	9	3	3	0.06
44.	*Hymenolaena candollei* DC.	Candolle's paper cup flower	Herb	Mental decline		Other city	5	2	2.5	0.03
45.	*Ligusticopsis wallichiana* Pimenov & Kljuykov	Milky parsley	Tree	Thyroid health		Other city	2	3	0.66	0.01
46.	*Oenanthe linearis* Wall. ex DC.	Water dropwort	Herb	Hepatitis, Jaundice, alcohol hangover,		Other city	7	2	3.5	0.04

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				abdominal pain						
47.	*Oenanthe Thomsonii* C.B. Clarke	Thomson's water drop worts	Herb	Fever, urinary difficulties		Other city	3	4	0.75	0.02
48.	*Pastinaca sativa* L.	Parsnip	Herb	Laxative, libido enhancer, kidneystone		Quetta	9	4	2.25	0.06
49.	*Selinum filicifolium* L.	Fern-leaf milk parsley	Shrub	Cough, headache		Quetta	4	4	1	0.02
50.	*Semenovia candicans* Wall. ex DC.	White-leaf	Herb	Diuretic		Other city	1	2	0.5	0.006
51.	*Scandix pecten-veneris* L.	Venus's comb	Herb\ vine	Toothache		Quetta	2	4	0.05	0.01
52.	*Torilis japonica* (Houtt.) DC	Upright hedge parsley	Herb	Anthelimintic, anti-fungal, anti-viral, expectorant tonic		Other city	12	3	4	0.08
53.	*Torilis nodosa* (L.) Gaertn.	Knotted hedge	Herb	Anti-oxidant, anti-hypertension		Other city	5	5	1	0.03
54.	*Trachyspermum roxburghianum* (DC.) H. Wolff	Wild cerlery	Herb	Diarrhea, gastritis, loss of appetite, vomiting, abdominal distention, stomachache, worm disease		Quetta	11	7	3	0.07

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Table no. 3 Percentage of species and citation in each medicinal use category.

Disease categories	No. of use reports	Percentage of use reports	No. of species	Percentage of taxa use	Informant consensus factor (ICF)
Blood pressure	17	24.6	2	7.14	0.93
Bacteria and fungi allergies	3	4.34	1	3.57	1
Cholesterol	4	5.79	2	7.14	0.66
Infections	5	7.24	1	3.57	1
Digestion	6	8.69	4	14.3	0.4
Cough	19	22.53	11	39.3	0.44
Arthritis	2	2.89	1	3.57	1
Rhemation	2	2.89	1	3.57	1
Gaut	2	2.89	1	3.57	1
Congestion	3	4.34	2	7.14	0.5
Combact peptie	4	5.8	2	7.14	0.66
			13	46.4	0.42

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Ulcer	22	31.88			
Indigestion	5	7.24	3	10.7	0.5
Cancer	20	28.98	9	32.1	0.57
Cardiovascular disease	34	49.27	12	42.9	0.66
Anti-inflammatory	10	14.49	6	21.4	0.44
Weight loss	67	97.1	28	100	0.59
Anemia	35	50.7	14	50	0.61
Intestinal gas	28	40.6	15	53.6	1.5
Acute gastritis	8	11.6	3	10.7	0.71
Diabetes	55	79.7	13	46.42	2.77
Dyspepsia	7	10.1	4	14.3	0.5
Stroke	8	11.6	2	7.14	0.8
Constipation	37	56.6	17	60.7	0.55

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Ulcer of palate	6	8.7	2	7.14	0.8
Dysentry	6	8.7	3	10.7	0.6
Menorrhagia	7	10.1	4	14.3	0.5
Heart burning	56	81.2	18	64.3	0.69
Loss of appetite	14	20.3	9	32.14	0.38
Nervousness	20	29	13	46.4	0.36
Plague	11	16	7	25	0.4
Trouble sleeping	41	59.4	10	35.7	0.77
Cold	57	82.6	19	27.9	0.67
Depression	16	23.188	11	39.3	0.55
Influenza	34	49.3	18	64.3	0.48
Pain	23	33.3	10	35.7	0.59

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Liver disease	12	17.4	7	25	0.45
Fever	37	53.62	14	50	0.63
Digestive disorder	30	43.48	12	42.9	0.62
Rhiritus	3	4.35	1	3.57	1
Sinusutis	5	7.25	2	7.14	0.75
Swelling	26	37.68	13	46.4	0.52
Wounds	14	20.29	8	28.6	0.46
Skin conditions	69	100.00	20	71.4	0.72
Mental clarity	13	18.84	6	21.4	3.5
Stomach pains	52	75.36	21	75	0.60
Blood sugar	11	15.94	6	21.4	0.5
Hysteria	2	2.9	1	3.57	1
	16	23.2	9	32.14	0.46

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Bronchitis					
Asthma	29	42.03	11	39.3	0.64
Pnuemia	21	30.4	9	32.1	0.6
Endocrine	2	2.9	1	3.57	1
Respiratory problems	8	11.6	5	17.9	0.42
Anti-microbial	4	5.8	2	7.14	0.66
Immune system	31	44.92	18	64.3	0.43
Skin ulcer	18	26.09	10	35.7	0.47
Thyroid	18	26.09	6	21.4	0.70
Hepatitis	25	36.2	12	42.9	0.54
Juandice	33	47.8	16	57.14	0.53
Alcohol hangover	9	13.04	5	17.9	0.5
	50	72.5	12	42.9	0.77

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Urinary difficulty					
Laxative	2	2.9	1	3.57	1
Libido enhancer	3	4.35	2	7.14 66.6	0.5
Kidney stone	6	8.7	2	7.14	0.8
Headache	7	10.14	4	14.3	0.5
Hypertension	8	11.6	3	10.71	0.71
Diuertic	3	4.35	1	3.57	1
Toothache	15	21.7	8	28.57	0.5
Anthlimintic	5	7.25	3	10.71	0.5
Anti-oxidant	5	7.25	7	25	0.53
Anti-viral	14	20.2	1	3.57	1
Expectorate toxic	2	2.9	2	7.14	0.75

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Gastritis	13	18.8	6	21.4	0.58
Vomiting	11	15.94	7	25	0.4
Abdominal distension	16	23.1	9	32.14	0.46
Worm disease	13	18.8	3	10.71	0.83

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