



Research Article

Uses of Wild Animals and their Body Parts in Traditional Medicine by the Local Communities of District Dera Ismail Khan

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Abstract | Wildlife products have been valued for use in various medicines. In traditional medicine, especially in Asia, the use of wildlife products, which are often derived from threatened or endangered species, is still predominant. This study investigated and documented species of wild animals used for the treatment by traditional inhabitants in the district Dera Ismail Khan, Khyber Pakhtunkhwa area of Pakistan. Data were collected from June 2020 to September 2020 and the majority of respondents's male with the occupation of Hakeem and Pansar. In this study, we interviewed 50 respondents. The sampling method was nonrandom, and the interviewees were predefined; some interviews were cancelled, because interviewees were reluctant to answer questions. At least 30 wild animal species were used in traditional medicine, of which 7 species are categorized as globally threatened species. Animals were distributed in five zoological groups, including mammals (12 species; 40%), birds (8; 26.66%), reptiles (5; 16.66%), insects (4; 13.33%) and fish (1; 3.33%). The high number of *Uromastix* recorded as medicinal use, among mammals, the Indian crested porcupine was the most killed animal, followed by the Asiatic jackal, Wild boar, Indus blind dolphin, Hog deer, Grey wolf, Musk deer, Indian red fox and Indian pangolin. They obtained body parts or live specimens from the market (26; 52%) and local poachers (24; 48%). Body parts used for medicinal purposes were fats, meat, whole skin, brain, bone, blood, feathers, horns, bone marrow, and scales were also used. Animal-based medicine was used for the treatment of emulsification, paralysis, bone fractures, piles, epilepsy, asthma, stomach pain, ulcer, deafness, measles and menstrual cycle. Animals used in medicine are under some form of legal protection. Indus blind dolphin (*Platanista gangetica*), Musk deer (*Moschus moschiferus*), Hog deer (*Axis porcinus*) and Indian pangolin (*Manis crassicaudata*) are listed as endangered, while Black bear (*Ursus thibetanus*), Mointer lizard (*Varanus*) and Common leopard (*Panthera pardus*) are vulnerable. We recommended a detailed study of illegal trade for medicinal purposes and its impact on globally threatened wildlife species, as well as on human health (COVID-19). Further chemical profiling and bioactivity studies may lead to the discovery of novel animal-based drugs.

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Introduction

Wildlife products have, for centuries, been highly valued for use in different medicines. In traditional medicine, the practice of wild animal products, often derived from endangered or threatened species, still dominate, mainly in Asia (Gibbon *et al.*, 2000). The commercialization and use of biological resources as treatments involve cultural, social and economic aspects and has major conservation implications, especially with regard to the most widely exploited species (Ferreira *et al.*, 2013). There are many factors contributing to the wild species loss, including habitat fragmentation, alterations and destruction, climate change, disease, heterologous chemicals, ultraviolet radiation and non-native species. In addition, poaching of wild animals for marketing or earning an income has led to the decline of certain species in recent decades (Gibbon *et al.*, 2000).

Trade in wildlife is estimated to be the world's third largest unlawful trade, second only to trafficking in drugs and arms, worth billions of dollars annually (Barber, 2010). It is recorded in history that there are a variety of connections between people and their surroundings. The interactions of human beings with natural resources, i.e., with plants and animals, are the demand of human societies (Ahmed *et al.*, 2008). These associations between human beings and their environment can be understood from the ethnobiological point of view. Ethnobiology is the systematic approach that pinpoints the past and present interrelationships between people and the environment, including plants and animals (Bagde and Jain, 2013). These animal resources have major contributions in the life of human beings from many points of view, including philosophical, cultural, artistic and religious. The primary reason for taming animals was to supplement the human diet with meat, milk, and eggs. Initially, domestication served food purposes only, but later it was realized that animals could also be used for tasks such as pulling plows and wagons, thereby enhancing human productivity (Vats and Thomas, 2015).

The folk medicinal setup forms the background for the existence of life is the most valued and complex system. Nature is assuming implausible invocations to human beings as it is a base that fulfils necessities, including shelter, food and health facilities according

to the needs of human beings (Hurly and Walker, 2019). Across the world, the folk medicinal system has been an indispensable part. These folk medicines play an imperative role mostly in rural areas, even though the demand for these medicines is in most parts of the world where there are human societies and as this system is beneficial as compared to modern pharmaceuticals, therefore, it shall play an important part in the future as well (Mishra and Rout, 2009). Faunal resources have a crucial role in human life from the earliest times, for this reason, human beings are well known for the use of animals to fulfill basic demands of life, including food, clothes and health remedies (Vats and Thomas, 2015). So, we can say that this use of animals for human welfare can be entitled to ethnozoology. Therefore, ethnozoology can be contemplated as an instinctive connection among native people and animal species (Altaf *et al.*, 2017). Undeniably, faunal resources are curative weapons that have pivotal roles in health care practices (Altaf *et al.*, 2018).

Thus, the treatment of different human diseases by using faunal resources is termed zotherapy. It provides a pathway for the development of new pharmaceuticals in a modern medicinal system (El-Deir *et al.*, 2012). Zotherapy has a chief part in the modern medical system besides all other known methods of health care. Most of the animal's parts and products like skin, fats, blood, meat, milk, eggs, hooves, feathers, tusks and honey have been used in the formation of medicines used for the treatment of various human diseases. As this indigenous knowledge used for therapeutic remedies is passed orally from one generation to the next generation so there are more chances of dissipation of this knowledge due to rapid environmental, technological and socioeconomic changes (Kareesh *et al.*, 2005). The possible way to solve this matter is that this knowledge should be conserved and documented so that it will be available to future generations. Although a great deal of ethnozoological work has been done in most parts of the world, Pakistan is much behind in this regard. In Punjab, Pakistan, 108 Mammalian and Bird species have been reported for their cultural and ethnomedicinal uses (Altaf *et al.*, 2017). No such studies have been reported from this region for the use of animals and their products as folk medicines. Therefore, the present study was planned for the documentation of such folk knowledge about the use of animal species to heal different human ailments

found among the local communities of District Dera Ismail Khan.

Data collection and analysis

Study area: Pakistan is an extratropical country with a latitude of 24° to 37°N and a longitude of 61° to 75°E. It has four provinces, i.e., Baluchistan, Punjab, Sind, and Khyber Pakhtunkhwa (KP). The north and north-western parts of the country are mountainous, however greatest of the central and southern parts are sedimentary plains and a several deserts. The average annual precipitation ranges from 100 mm in the south to 1,500 mm in the north. From the freezing point to 50°C, the temperature varies. Dera Ismail Khan (D.I. Khan) is the southernmost district of Khyber Pakhtunkhwa (KP). The geographical spread of D.I. Khan lies between 31° 15' and 32° 32' N. and 70° 05' and 71° 22' E. The district's total area is 7326 square kilometers. The district boundaries are surrounded by Tank and Lakki Marwat district of KP towards north, Mianwali and Bhakkar district of the Punjab on the east, Dera Ghazi Khan district of the Punjab on the west and adjoining Tribal area of South Waziristan agency and Tank district respectively (Mehdi, 2009).

Materials and Methods

Data collection

Questionnaire survey: Initially the whole district was selected and then we collected the information from the people involved in the traditional medicinal practices. We targeted the people involved in this business like hakeems, pansars and other traditional medicinal therapeutics. Ethnozoological survey was conducted in June 2020 to September 2020. Most of the people do not share the information from the fear of wildlife department and government agencies. We followed the following protocol in the field in order to respect intellectual property rights: before the survey, we introduced ourselves, explained the purpose and aims of our study, and asked the respondents for permission to record the details. Data collected through field surveys, which mainly include semi-structured interviews and face to face conversation with local informants to gather information about animals used as medicines (Shoukat *et al.*, 2020). Study aim was to collect information from 100 respondents but only a total of 50 respondents were present in my study area. A total of 50 (48 males, 2 females) people were selected to collect ethnozoological information. To obtain knowledge and experience of the animals

and their items used in folk therapy, informants were chosen. Among these interviewees 28% were aged 30 to 40 years, 48% were 41 to 50 years old and 16% were aged from 51 to 60 years respectively 4% were aged from 61 to 70 years and 4% were aged from more than 70 years. Most of the informants were traditional skilled healers and these people have adequate knowledge of animal-based treatments since they practice these for the treatment of certain diseases (Shoukat *et al.*, 2020). We have come to realize that the people of the region have strong faith in these remedies based on animals. The information obtained through semi structured interviews was complemented by free interviews and, participants were asked to provide vernacular names, medicinal use, parts used, preparation and administration of the remedy for each animal cited. Information was also collected on the source of the specimen, number of individuals killed, dosage against disease, annual income generated by illegal means.

Details on the conservation status of animal species were collected from the Red List (<http://www.iucnredlist.org/>) of the International Trade in Endangered Species of Wild Fauna and Flora Convention (<http://www.cites.org/eng/resources/species.html>) of the International Union for the Conservation of Nature.

Statistical analysis

The data was arranged and compiled in excel. By using Statistical Package for the Social Sciences (SPSS), Correlation coefficient was calculated to measure the strength of the relationship between two variables.

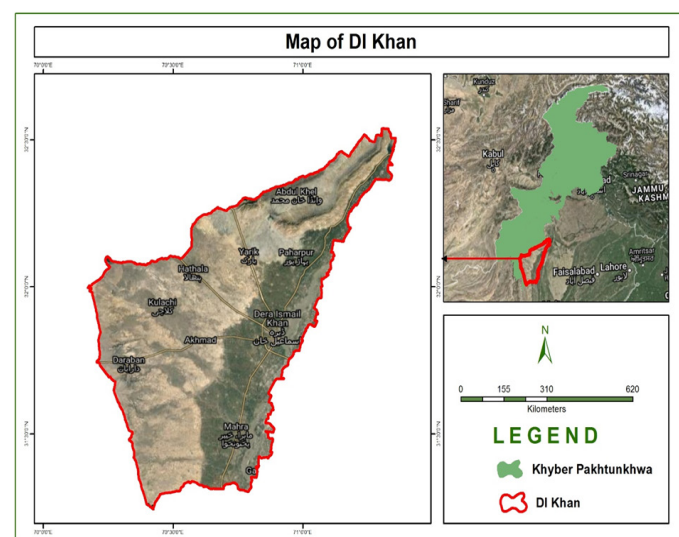


Figure 1: Map of the study area of district Dera Ismail Khan.

Results and Discussion

In Dera Ismail Khan district, this ethno-zoological study documented about 30 animal species belonging to almost 5 classes used for the treatment of 27 human diseases. Animal species zoological names, together with common names, parts(s) or products(s) used in the disease or disease for which animal-derived medicinal products are effective. The highest number of animals used in ethnozoology was Mammalia (12 species), followed by Aves (8 species), Reptilia (5 species), Arthropoda (1 species), Arachnida (1 species), Malacostraca (1 species), and Fish (1 species). In similar works, mammals and birds have always been widely used as traditional medicines around the world. The respondents of different ages were interviewed for the collection of the data about the traditional medicine, their treatment and mode of preparation in the study area. The maximum respondents were belonging from 41 to 50 years age, followed by 31 to 40 years age and the minimum number of respondents were more than 70 years old. Similar research studies were conducted in India, where the age of the respondents ranged from 31 to 80 years. With only 21 %, the %age of local medical

practitioners with an age of less than fifty was found to be very small compared to 79 % of the age group of society above 50 years (Borah and Prasad, 2017). The demographic data of the respondents showed that the aged classes of society were more knowledgeable relating to traditional medicinal purposes than the younger generation (Verma et al., 2014). Whereas the study showed in our case that the highest number of medicinal practitioners was 48 % between 41-50 years of age. The maximum number of respondents were related to the occupation of Hakeem, followed by Pansar and housewife. The one traditional practitioner was related to the field of electrocardiography (ECG) technician.

Table 1: Some species in each animal group.

S. No	Animal group	Number of species	%age
1	Mammalia	12	24%
2	Aves	8	16%
3	Reptilia	5	10%
4	Arthropoda	1	2%
5	Arachnida	1	2%
6	Malacostraca	1	2%
7	Fish	1	2%

Table 2: The detailed list of Wild animals used for Medicinal purposes in District Dera Ismail Khan.

Scientific name	Local name/ Eng. name	Parts use	Medicinal use	How use	IUCN status	No. of cases reported
<i>Naja melanoleuca</i>	Black cobra	Fats	Pain, Paralyze, Muscle Pain	Massage	LC	40
<i>Scorpiones</i>	Scorpion	Full Body	Antidote Against Scorpion Bite	Massage on the wound	DD	50
<i>Scorpiones</i>	Scorpion	Full Body	For Poisonous	Massage on the wound	DD	500
<i>Platanista gangetica</i>	Indus blind dolphin	Fats	Muscle Weakness, Body Pain	Massage	EN	20
<i>Saara hardwickii</i>	Uromastyx	Fats	Muscle Weakness, Joint Pain	Massage		1000
<i>Saara hardwickii</i>	Uromastyx	Fats	Pain, Muscle Weakness	Massage		500
<i>Moschus</i>	Musk deer	Skin	Muscle Weakness, Nerve Weakness,	Orally	EN	2
	Regmai	Full Body	Bone Fracture	Massage/Orally		180
<i>Brachyura</i>	Crab	Full Body	Illness,	Orally	DD	800
<i>Naja melanoleuca</i>	Black cobra	Bones	Piles	Orally	LC	400
<i>Saara hardwickii</i>	Uromastyx	Fats	Emulsification	Massage		300
<i>Parvo cristatus</i>	Peafowl	Blood, Meat	Side Pain, Healing Wounds	Orally	LC	180
<i>Testudinidae</i>	Tortoise	Meat, Bone Marrow	Menstrual Cycle, Back Strength, Epilepsy	Orally	LC	70
<i>Hystrix indica</i>	Indian crested porcupine	Meat	Asthema	Orally	LC	120
<i>Naja melanoleuca</i>	Black cobra	Fats	Pain, Emulsification, Joint Pain	Massage	LC	200

Table continues on next page.....

Scientific name	Local name/ Eng. name	Parts use	Medicinal use	How use	IUCN status	No. of cases reported
<i>Axis porcinus</i>	Hog deer	Fats	Muscle Pain, Paralysis	Massage	EN	14
<i>Cygnus</i>	Swan	Fats	Muscle Pain	Massage	LC	120
<i>Canis aureus</i>	Asiatic jackal	Bones	Magic Rituals	Magic	LC	24
<i>Scorpiones</i>	Scorpion	Full Body	Joint Pain, Muscle Pain	Massage	DD	2000
<i>Ursus americanus</i>	Black bear	Fats	Body Pain, Muscle Pain, Joint Pain	Massage	VU	4
<i>Vulpes vulpes linn</i>	Indian red fox	Fats	Muscle Pain, Emulsification	Massage	LC	5
<i>Varanus</i>	Monitor lizard	Full Body	Emulsification, Joint Pain, Muscle Pain	Massage	VU	25
<i>Ardeidae</i>	Egret species	Meat	Produce Good Quality of Blood	Orally	LC	140
<i>Francolinus</i>	Francolin species	Meat	Increase Memory, Paralysis	Orally	LC	400
<i>Sus scrofa</i>	Wildboar	Meat	Slow Digestion of Food	Orally	LC	40
<i>Ursus americanus</i>	Black Bear	Fats	Emulsification, Wound Healing	Massage	VU	3
<i>Chiroptera</i>	Bats	Fats	Emulsification, Joint Pain, Body Pain	Massage		90
<i>Axis porcinus</i>	Hog deer	Horns	Ulcer, Body Pain	Orally	EN	5
<i>Panthera pardus</i>	Common leopard	Fats	Measles	Massage	VU	2
<i>Coturnix coturnix</i>	Quail	Meat	Emulsification	Orally	LC	1500
<i>Moschus</i>	Musk deer	Skin	Emulsification for Both Male and Female	Orally	EN	2
	Regmai	Full Body	Muscle Pain, Bone Fracture	Orally		400
<i>Caelifera</i>	Grasshoppers	Full Body	Asthma	Orally	LC	2000
<i>Hystrix indica</i>	Indian crested porcupine	Meat	Asthma	Orally	LC	40
<i>Saara hardwickii</i>	Uromastyx	Fats	Emulsification	Topical		800
<i>Ursus americanus</i>	Black bear	Fats	Hair fall, Emulsification	Topical	VU	3
<i>Canis aureus</i>	Asiatic jackal	Brain	Magic Rituals	Magic	LC	18
<i>Moschus</i>	Musk deer	Skin	Emulsification	Orally	EN	1
<i>Scorpiones</i>	Scorpion	Whole	Antidote Against Scorpion Bite	Topical	DD	1000
<i>Naja melanoleuca</i>	Black cobra	Fats	Emulsification	Topical	LC	200
<i>Pavo cristatus</i>	Peafowl	Feathers	Healing Wounds	Topical	LC	120
<i>Zootoca vivipara</i>	Common lizard	Full Body	Menstrual Cycle	Orally	DD	400
<i>Struthio camelus</i>	Ostrich	Meat	Skin Infection	Orally	LC	24
<i>Canis lupus</i>	Grey wolf	Meat	Stomach Pain, Liver Diseases	Orally	LC	12
<i>Columbidae</i>	Dove species	Meat	Cough, Emulsification	Orally	LC	300
<i>Chiroptera</i>	Bats	Fats	Emulsification	Topical		500
<i>Manis crassicaudata</i>	Indian Pangolin	Scales	Deafness	Orally	EN	2
<i>Brachyura</i>	Crab	Whole	Asthma	Orally	DD	500
<i>Passer domesticus</i>	House sparrow	Meat	Emulsification	Orally	LC	1000
<i>Saara hardwickii</i>	Uromastyx	Fats	Emulsification, Joint Pain	Topical		300

Multiple species that have been killed and used for the treatment of different diseases were 30 in number as total. The highest number was from Uromystix, used by about 5 hakeems, while 2nd highest was black cobra and scorpion, used 4 times by practitioners. The different parts include fats, meat, blood, horns, skin

and bones. The most used body parts are fats followed by meat, complete body, skin, bones, feathers and so on. Different species are used for different diseases. The main diseases were emulsification, muscle pain, paralysis, asthma, ulcer, measles and menstrual cycle . The species used as topical were 24 in number and

those species consumed orally were also 24 in number, while the lowest species used in Magic rituals were two. A total of 30 identified animal species is included in the IUCN Red Data List, of which 25 (83.33%) are included in the IUCN Red List. It is noteworthy to emphasize the species enlisted here, as Indus blind dolphin, Musk deer, Hog deer and Indian pangolin are listed as endangered, while Black bear, Mointer lizard and Common leopard are vulnerable in the IUCN Red Data list.

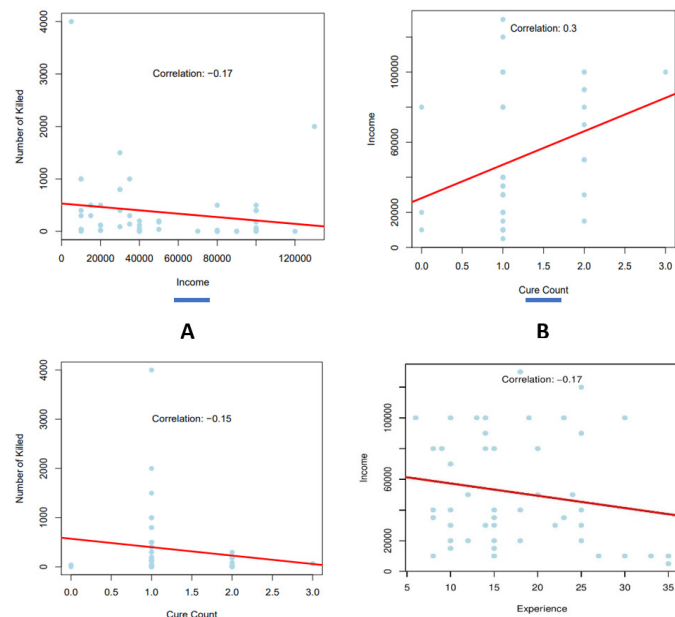


Figure 2: Impact of different variables (A) Number of killed vs. Income, (B) Cure count vs. Income, (C) Cure count vs. Number of killed, (D) Experience vs. Income.

A correlation coefficient was used to check the relation or association between variables. There is no relationship between the number of specimens killed for medicinal values vs. the income generated through the sale of products prepared by using various parts of the animal body (A) (Figure 2). There is a weak, uphill (positive) linear relationship between income and the case count of the disease. As the number and demand of products for medicinal values increased, the income of the people involved in this business also increased. Similarly, we performed a correlation coefficient for other variables and we found no relationship between the number of species killed for medicinal purposes vs. cure count (C) and income generated through the sale of products prepared from animal vs. experience of the people involved in this job (D).

Wild animal species killed

Multiple species that have been killed and used for the treatment of different diseases numbered 30

in numbers as total. The highest number was from uromystix, used by about 5 hakeems, while 2nd highest was black cobra and scorpion, used 4 times by practitioners, while the lowest was the single usage of different species by practitioners.

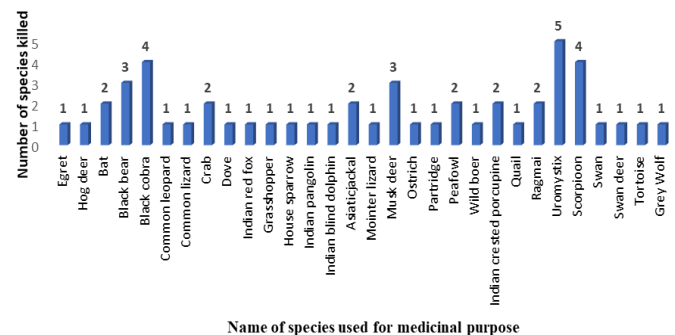


Figure 3: Species of wild animals used in traditional medicine.

The same study was carried out in India, where the tribes of the Chindwara Gond used thirty animal species to treat more than 41 types of ailments. The animal species used as traditional medicine by these individuals were 18 mammals, 7 birds and 3 reptiles, one amphibian and one fish. The taxonomic group of mammals had the highest number of animals, followed by birds, amphibians and fish (Bagde and Jain, 2013). A record number of 15 different animal species have also been recorded for medicinal use by the Rajasthan community of Mogya, Bawaria and Meena (Mahawar and Jaroli, 2007).

Various body parts of wild animals used for medicinal purposes

In the above-mentioned species, different parts of these wild animals were used for the treatment of different ailments. These different parts include fats, meat, blood, horns, skin and bones. The most used body parts are fats followed by meat, complete body, skin, bones, feathers and so on. Fats were used 17 times by different practitioners, meat and full body 12 and 11 times by practitioners. Meat was the most used component of the body and was used in 36 ingredients in Jhelum and 34 in Lahore, followed by oil and brain in both districts in 20 and 16 ingredients, and fat in 15 and 16 ingredients. Milk, skin, bones, eggs, scales, saliva, blood, urine, testicles, and carapace were used in fewer than five recipes (Altaf et al., 2018). Fat, flesh, bone, bone marrow, cartilage, skin, tail, feather, liver, bile ('fel'), milk, rattle, spine, shell, honey, wax, scale, rostral expansion, otolith, penis, carapace, blood, gizzard, beak, insect cocoon, teeth, tongue, eggs, shells of eggs, tibia,

secretions, head, heart, urine, foot, legs, nest, guts, bezoar, ear, paw, and spawn are the body parts used in traditional medicine (Alves and Alves, 2011).

Indian pangolins have been used by indigenous people as bush meat (20.59 %) and in traditional medicine (79.41 %) and their different body parts as well. In the field of traditional medicine, pangolins have been used to cure several human ailments and to make charms (Setlalekgomo, 2014). In his 2011 study, Mishra concluded that raw or cooked forms of medicinal animal parts, fat, feathers, hair, bile, oil, blood, tusks, milk, and liver were used for the treatment of 12 different diseases. Piles, asthma, skin diseases, fever and rheumatism were the most cited illnesses. The above 11 body parts were used for the treatment of 17 different ailments and diseases, in which the blood of peafowl was used for the production of good-quality blood in the human body. Bones were used twice, of black cobra and jackal, for piles and magic rituals. The brain was also used 2 times on an Asiatic jackal for magic rituals. Fats of different animals like black cobra, indus blind dolphin, uromastix, hog deer, swan, black bear, indian red fox, bats and common leopard were used 17 times for different medicinal values like muscle pain, body pain, paralyze, muscle weakness, emulsification, wound healing, joint pain, measles and hair fall etc. Feathers had been used a single time for healing wounds from peafowl. Full body was used 11 times from different species for different medicinal purposes, including species like scorpion, crab, regmai, monitor lizard, grasshopper, and common lizard. Horns of hog deer were used for ulcer treatment and body pain. The meat of peafowl was used for healing wounds, tortoise meat for regulating the menstrual cycle, back strength, and epilepsy. Meat of Indian crested porcupine is used for asthma, meat of egret to produce good quality of blood, meat of francolin to increase memory and for treatment of paralysis, meat of wild boar for the normalization of slow digestion of food, quail meat for emulsification, common lizard full body for regulating menstrual cycle while ostrich, grey wolf, dove and house sparrow meat is used for skin infection, stomach pain, liver disease, cough and emulsification. Bone marrow, scales and skin of tortoise, Indian pangolin and musk deer were used for back strength, epilepsy, deafness, muscle weakness, nerve weakness, and black magic.

Mode of administration of traditional medicine

Different species were used in many ways for various

diseases. Some species remedies were used orally, some as topical and some were used in magic rituals. The species used as topical were 24 in number and those species consumed orally were also 24 in number, while the lowest species used in Magic rituals were two.

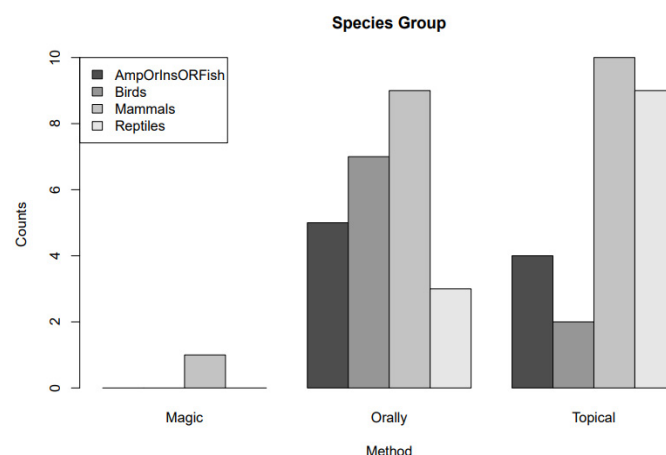


Figure 4: Mode of administration of wild animal species.

We collected information on how they obtained the knowledge on using traditional medicine of the wild animals. Mainly of the 32 respondents got knowledge from the literature and 18 traditional practitioners replied that they got knowledge of traditional medicines from hakeems. The wild animals were provided both by the market and by local poachers. 26(52%) respondents say that the species were available in the market and 24 respondents say that the species were obtained from the wild with the help of local poachers. They were asked about animal-based drugs and the way the medicines were prepared. In the preparation mode, many species were used simply as meat in traditional medicine. Fats are extracted from different wild animals in different ways and used as a remedy for various diseases. The highest number of traditional medicinal value species belonged to the mammalian taxonomic group (n=12), followed by birds (n=8), reptiles (n=5), insects (n=4) and fish (n=1).

Similar research was carried out in Madhya Pradesh, India, where the highest number of animals belonged to the taxonomic group of mammals (N=18, 60 %), followed by birds (n=7, 23 %), reptiles (n=3, 10 %), amphibians (n=1, 3.3 %), fish (n=1, 3.3 %) and reptiles (n=3, 10 %) (Bagde and Jain, 2013). 57 animal species, including mammals, birds, reptiles, fish, amphibians, and invertebrates have ethnomedicinal uses (30, 25, 7, 25, 3.5, and 3.5 %, respectively) (Altaf et al., 2018). Among these taxonomic groups mentioned above,

there are both domesticated and wild animal species, while in my study, all animal species are wild. Insects, which can be easily collected from natural resources, were mostly used in traditional medicines, followed by Birds, Reptiles, Fish and mammals. Mammal species used in traditional medicines are difficult to collect from the field because of strict wildlife laws, their low population size and hard to capture.

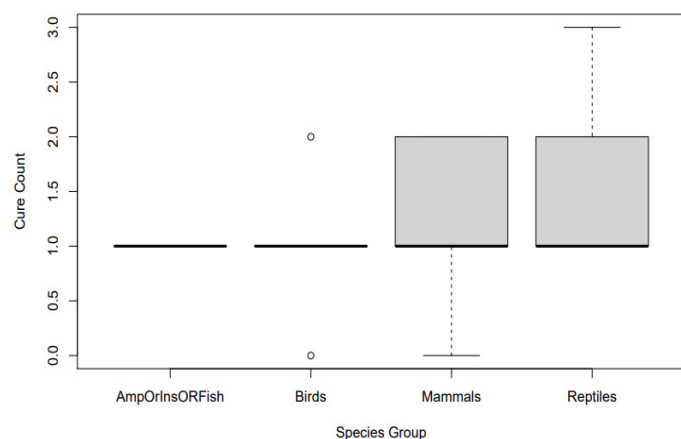


Figure 5: The relationship between cure count and utilized group wild animals.

The counts of wild animals over different levels of specimen source

The counts of wild animals over different levels of body parts used in medicines and specimen sources are presented. The animal species were provided both by the market and by local poachers and from the wild. 25(50%) respondents say that the species were available from the market and 24(48%) respondents say that the species were obtained local market. The massive use of wild animals poses serious threats to their survival, specifically for globally threatened wildlife species. There is a need to identify and highlight the sources and markets of illegal trade and smuggling of wild animals.

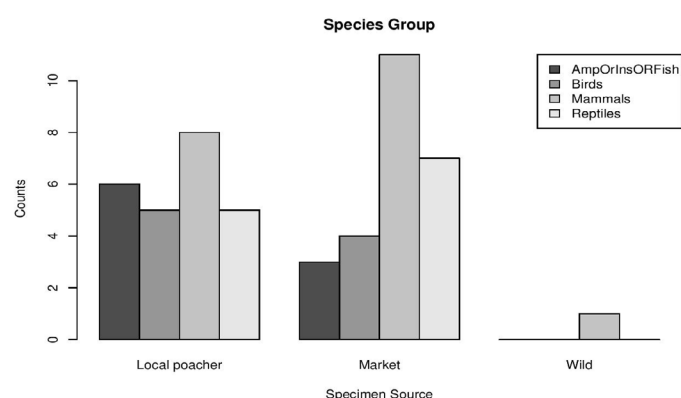


Figure 6: The counts of wild animals over different levels of body parts are presented.

This study documented the ethno-zoological study in the district of Dera Ismail Khan. About 30 animal species belonging to almost 5 classes were evaluated for the healing of 27 human diseases. The zoological names of animal species, together with the common names, parts(s) or products(s) used for the disease or disease for which animal-derived medicinal products are effective, have been evaluated. The respondents of different ages and occupations were interviewed for the collection of data about the traditional medicine, their treatment and mode of preparation in the study area. Our findings showed the continuation of traditional medicinal practice in Dera Ismail Khan, where local communities continue to rely on indigenous health care knowledge that is influenced by cultural and socio-economic aspects, offering a cheaper and more accessible alternative to high-cost pharmaceutical remedies. The use of animals and animal-derived products for indigenous medicinal purposes on the study site is the main primary health care system. Traditional knowledge is not only important for its pharmacological value, but also related to indigenous people's different cultural beliefs and feelings. This study provides the basis for further scientific validation of the therapeutic effectiveness of the different traditional zootherapeutic uses of these individuals and the discovery of new biological compounds in order to discover new drugs. The ethnozoological knowledge of the locals in the study area indicates that their environment and animals are significantly associated with them. Through field survey research, 30 wild animals with ethnozoological significance, mainly mammals, birds, insects, reptiles and fish species, were identified. They all have medicinal treatment for 27 diseases in humans. There is, therefore, the greatest demand for the correct recording of important medicinal animals and their parts and products. In order to ensure the medicinal importance of animal species and their products, additional research work is essential for scientific approval. Despite their significance, when compared with plants, there have been neglected studies on the therapeutic uses of animals and their body parts. Additional motivation for such activities is indeed the practical need to integrate the potential of traditional medicine into the current practices of modern health care. It is important to emphasize that some traditional medical systems, such as Traditional Chinese Medicine, are recognized and accepted by one-fourth of the world's human population by the WHO-World Health Organization.

Conclusion and Recommendations

This study documented the ethno-zoological study in the district Dera Ismail Khan. About 30 animal species belonging to almost 5 classes were evaluated used for the healing of 27 human diseases. The zoological names of animal species, together with the common names, parts(s) or products(s) used for the disease or disease for which animal-derived medicinal products are effective, have been evaluated. The respondents of different ages and occupation were interviewed for the collection of the data about the traditional medicine, their treatment and mode of preparation in the study area. Our findings showed the continuation of traditional medicinal practice in Dera Ismail Khan that local communities continue to rely on indigenous health care knowledge that is influenced by cultural and socio-economic aspects, offering a cheaper and more accessible alternative to high-cost pharmaceutical remedies. The use of animals and animal-derived products for indigenous medicinal purposes on the study site is the main primary health care system. Traditional knowledge is not only important for its pharmacological value, but also related to indigenous people's different cultural beliefs and feelings. This study provides the basis for further scientific validation of the therapeutic effectiveness of the different traditional zootherapeutic uses of these individuals and the discovery of new biological compounds in order to discover new drugs. The concerned Dept must investigate and implement the criteria for Ethnozoological uses of wild animals defined by the WHO – World Health Organization. The number of specimens killed is more than documented, we also recommend further scientific study to investigate the number and type of wild animals that have been utilized for the ethnozoological purpose. More studies are needed for scientific approval to ensure the medicinal importance of animal species and their products

Novelty Statement

This study is the first to systematically document the use of wild animal species in traditional medicine in Dera Ismail Khan, revealing the reliance on several globally threatened species and highlighting the urgent need to address the link between illegal wildlife trade, conservation, and human health risks.

Author's Contribution

Saif Ullah Khan: Main Frame, Data collection, Final Review
 Dr. Nowsherwan Zarif: Topic selection
 Salman Ahmad: Data analysis
 Basheer Ahmad: Proof Reading
 Dr. Anwar Ali: Final Review of the manuscript
 Dr. Muhammad Kabir: Data Analysis

Generative AI and AI-assisted technology statement

The authors declare that no Genrative AI was used in the creation of this manuscript.

Conflict of interest

The authors have declared no conflict of interest.

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