

EXPLORING THE KNOWLEDGE ACQUISITION SOURCES OF INDIGENOUS PEOPLES IN THE UTILIZATION OF MEDICINAL PLANTS

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Abstract. Indigenous knowledge of medicinal plants is a vital cultural heritage that supports community health, yet its transmission remains understudied. This research identifies the sources through which native communities acquire and preserve this knowledge. In this applied cross-sectional study, data were collected from 150 local experts across 10 villages in the Paskaloot region using semi-structured questionnaires and face-to-face interviews (Snowball method). Participants reported demographic details, medicinal plant uses, and knowledge sources. Elders were the primary knowledge sources (90% oral transmission from grandparents/parents), followed by books (23.3%) and media (10%). Women constituted 40.6% of active users, employing plants for diverse ailments, while 26% never used them. Participants affirmed the efficacy of medicinal plants and stressed the urgency of preserving this knowledge before elders pass away. Systematic strategies are needed to safeguard and transmit indigenous medicinal plant knowledge to future generations. This study highlights the role of intergenerational oral traditions and calls for integrating documented and community-based preservation efforts.

Keywords: *medicinal plants, drugs, local plants, indigenous knowledge, information sources*

Introduction

The human being, in the world he lives in, use information and knowledge, achieved from different sources, to have a better, healthier and modern living or sometimes by compulsion of the nature and life s/he experiences it and no way out to lose more of his life to learn. Knowing more about things and the world around can make him and his life more developed, easier, healthier, cheaper and so on, but how and where from they learn and achieve it is also important. We can acquire our information, knowledge through different sources to use it in our life and make it better and fresher in a high level and different with some other animals since we are human and can think and this is the way to run the life better and promote. Then, knowing, information, knowledge from any kind and type of sources is important to stand the life much better than before. One of the ways of knowing is the knowledge of people's and experiential knowledge about that subject, which they have lived with for years, have benefited from it, or have seen its losses with their eyes and heart, and or have experienced it. Native knowledge is the knowledge formed over the time in a society according to its specific culture and based on experience, practical and informal test transmitted orally and from generation to generation to the present (Yousefi, 2012). One of the indigenous knowledge the people in one area may have been local knowledge on medicinal plants or drugs growing in their regions and the environment they live. Native residents for many

reasons from food stuffs to illnesses and diseases remedies have used medicinal plants in local areas for many years.

The historical utilization of plants as health remedies both for human and animal is centuries old. It has been recognized that plants have the capacity to combat several types of diseases ethno veterinary medicines, a term generally used for folk skills, beliefs, knowledge, practices, methods related to animals' health, and cure of various ailments in the rural areas (McCorkle and Green, 1998). Herbal medicine has been reported worldwide as an essential component of the cultural heritage of a group or society. In the rural areas of developing countries, where medicinal plants are often the only available and affordable treatment, the use of herbal preparations plays a crucial role in the livelihoods of people (Bruschi et al., 2019). Then, why and how is it important to study medicinal plants in local areas? It seems that medicinal plants are considered as rich resources of ingredients in nature used in drug development and drug synthetic. Knowledge and awareness of native and traditional knowledge is a way to know and receive the experience of the people of that country from generation to generation of medicinal plants, their growth, types, use and optimal and cheap price, which otherwise may be forgotten and with the death of each of the local elders will cause a huge part of this hidden treasure to be buried under the ground. Considering the existence of more than 8000 plant species and countless of these species of medicinal plants in the Paskaloot region, which can be considered unique in its kind in the world, its study and investigation and gathering of experiences in this matter, which is in the heart of nature. These plants can be fruitful and become a mass knowledge for the use of future generations and not interrupting this chain of knowledge. Identifying local knowledge related to them can lead to recording and using the properties of plants and knowledge related to them, local development and protection of plants and pastures in their growing area (Tabatabaee et al., 2019).

In some countries, herbal medicine may also contain by tradition, natural organic or inorganic active ingredients that are not of plant origin. Over 80% of people living in developing countries depend on herbal medicines as their immediate choice in the treatment of diseases showing its relevance and importance in Primary Health Care. In 1976, about a quarter of the prescription drugs dispensed by community pharmacy in the United States contained at least one active ingredient derived from plants (Alade et al., 2016). Medicinal plants have been a vital source of both curative and preventive medical therapy preparations for human beings, which also has been used for the extraction of important bioactive compounds (Mbuni et al., 2020). More than 30% of the entire plant species, at one time or other were used for medicinal purposes. It has been estimated, that in developed countries such as United States, plant drugs constitute as much as 25% of the total drugs, while in fast developing countries such as India and China, the contribution is as much as 80%. Thus, the economic importance of medicinal plants is much more to countries such as India than to rest of the world. These countries provide two third of the plants used in modern system of medicine and the health care system of rural population depend on indigenous systems of medicine (Khan, 2016). The expansion of the use of herbal medicines as well as medicinal plants and the creation of a negative view of chemical medicines due to the side effects of such medicines have led to the attention of local people's indigenous knowledge in relation to medicinal plants. Because this is indigenous knowledge that, if written down, can provide the necessary information about medicinal plants and their therapeutic

properties to traditional medicine experts, researchers, pharmaceutical companies and other stakeholders (Sabzi Nojadeh et al., 2021).

Paying little attention to the local knowledge of medicinal plants, as a huge treasure of years of experience of countless people who have lived with it and benefited from it when use, will be forgotten and the chain of transmission of local knowledge and experience to the next generations will be broken or it will face a serious challenge which will impose huge material, spiritual and human costs on humanity and human society and the sad story of reinventing the wheel will be repeated. How the people learn, achieve and grasp the idea on medicinal plants or what ways can be beneficial should be known and recognized to find a way out of the problems to miss the local and traditional knowledge that has been gained through years. The gained treasure should not be hidden under the ground when one of the olds of the region is dead, the knowledge of using medicinal plants or local drugs should be written, kept, stored and transferred properly to the youths and next generation in time. In the case of negligence of the matter, the human kind will lose all the experiences in different areas of the world where a huge part of knowledge is hidden through the olds and native inhabitant's minds and breasts waiting to be presented loudly to be stored, organized and transferred to new generation to be used, as it should be. They can be gathered in different ways and forms. The way is running now slowly and traditionally that is not enough, and is not a good way and proper in the present world. Some results of the researches said that nearly all the respondents (97%) that have had contact with herbs claimed that the highest medium of contact was through usage (approximately 40%), 25% acquired knowledge on herbs through their parents, while 37% had contact through a combination of usage, parents, Teachers and media, only less than 1 % had it through their teachers/literature (Alade et al., 2016). Then in Iran also people learn and acquire their knowledge from different sources that is important to know them and to make a plan for the way is needed to collect and store data, information and the knowledge of the pasts to the futures on medicinal plants. Then, the aim of the study was to survey the sources of acquiring knowledge of using medicinal plants traditionally by native people to find a way out to manage the matter.

Materials and Methods

The study covered 150 participants from 10 villages located in the rural area of Paskaloot region of Gonabad city in Khorasan-e-Razavi province in Iran. The participants or the samples size were selected by Morgan table method. The samples were randomly selected at first and then in each village of the region, the experts and the old ones of men and women who were satisfied to take part in our study and had enough knowledge as other people of the village said and accepted them as expert in the field, were selected to have some good and proper information and knowledge on medicinal plants in the local area. A semi structured questionnaire/Interview forms and informal conversation on the respondents was used to collect the data. The demographic and research data in two parts were gathered and collected. During the interviews, the participants, mostly the elders of the area, were asked to indicate the source of knowledge for each remedy (“How have you learned or know your current knowledge about medicinal plants and drugs in the area?”) After the data was collected from the community members, the data were analyzed through proper tests, SPSS-22 to evaluate the current data among the local people. The purpose of this study is to collect the

identity information of people in order to prevent them from being forgotten at the end of the life of the elderly and people with experience in the region and the methods of obtaining resources of knowledge, how to use medicinal plants, and to collect this information in the form of a special bank for others if necessary and benefit from it in any possible way for their future researches. Knowledge of the collected information and the methods and channels of obtaining information and knowledge about the use of medicinal plants can be a guide and a way forward in this direction and adapting to the upcoming and new cases and issues. According to the village population and the consent of the local people and if they were satisfied and liked to take part in our study as participants, they were selected and were chosen as a part to be asked and do the interview. The 10 villages are located in North-East of Gonabad city called as Paskaloot area.

Results and Discussion

150 participants from the said area were surveyed and the finding were written in the tables below. Demographic information and research questions results are as in *Table 1*. *Table 1* shows the number of the participants, 83 (55.3%) women and 67(44.7%) of men participated in the study. *Table 1* presents educational status of the participants that 121 of them were diploma or under, 28 (18.7%) diplomas to bachelor and 1 person had a higher degree of bachelor. *Table 1* shows that 61 (40.6%) of the women said they are used to apply medicinal plants for different purposes and ailments to prevent or treat. Some of the participants 39 (26%) never used them anyway. To answer the main question of the study for the sources the participants used to get medicinal plants usage, in *Table 1*, they cleared that they acquired their knowledge of how to use them gained it from their parents, 135 (90%), books & print sources, 35 (23.3%). The table shows the way they had learned the knowledge to use their local medicinal plants traditionally as other sources indicated. *Table 1* shows the goal of the participants for using medicinal plants. 122 (81.3%) used them for prevention, 150 (100%) participants said they uses them foe treatment of diseases (they were free to select more than one option).

Table 1. *The demographic profile of respondents.*

Category	Frequency	Percentage
Gender		
Female	83	55.3
Male	67	44.7
Education level		
Under Diploma	121	80.7
Diploma to bachelor	28	18.7
After bachelor	1	0.6
The use of local medicinal plants during Covid-19		
Female		
Yes	61	40.6
Somewhat	5	3.3
No (Never)	17	11.3
Male		
Yes	40	26.6
Somewhat	5	3.3
No (Never)	22	14.6

The participant sources of local knowledge acquisition		
Books & Print Sources	35	23.3
Media	15	10
Parents	135	90
My own Experience	45	30
Parents & Exp.	125	83.3
Others	25	16.7
The goal of the participants of the local use medicinal plant		
Prevention	122	81.3
Treatment	150	100
Industrial	35	23.3
Veterinary Medicine	78	52
Research	5	3.3
Cosmetics	77	51.3
Combination	0	0
Others	0	0

Medicinal plants were used traditionally in local area of the present study differently and for different purposes based on the knowledge they had and the needs of them. Some other factors such as: distance to the city of Gonabad to visit a physician, income level, literacy and being educated, age of the participants, having a car or not for going to the city, being aware of medicinal drugs usage, medicinal plants availability in the area or at home, having a woman at home to know the use of them anyway, having good experience, defining and promoting of neighbors from medicinal plants effect and so other reasons were involved in the picture to make and encourage the native people for using medicinal plants to treat or remedy of the ailments. The area such as other areas of the world has and is full of medicinal plants growing in different seasons and in different forms from botanic, trees, vegetables, minerals and some others. They have different potentiality and effect to prevent, treat and help the people overcome their illnesses and diseases during the old times from far years to the present. It is for many years that people of the region use them in their own habits, they have heard, learnt, experienced, read or had been advised. Most of the native said they had learned to know medicinal plants and use them from their ancestors, grandparents, parents, relatives, neighbors in their villages, some from media, books and libraries, their own experience and or a combination of all the ways. The results of some other researches also announced that they had learned the use of medicinal plants from their grandparents, parents or relatives, books, teachers, media and so on. Less than 1% had contact with herbs through formal education (teachers/literatures). Stimulation of interest was majorly through parents (53%). Grandparents were the highest (46%) of custodian of indigenous knowledge. Parents were the next (39.7%). Only 39% of the respondents would prefer the use of herbal medicine to modern medicine (Alade et al., 2016). Treatment process depends either on the traditional knowledge being orally transmitted to the current generation of local people from their ancestors or through personal experiences (Aziz et al., 2018). Fifty-one practitioners were traditional healers and the remaining number were village elders who had acquired familiarity on medicinal healing skills of plants from their parents and close relatives (Mbuni et al., 2020). Bruschi et.al stated that only 26 were the families for which data on plants' knowledge from both parents were available. Forty-four were the families with data available only from one parent: thirty-seven from the mother and seven from the father. Thirty families

had data from one or both grandparents. The remaining families had data from other relatives (Bruschi et al., 2019).

As it is clear that most of the native people living in the rural areas through the world use medicinal plants grown in their areas for ailments remedies overall because of so many reasons said before above. They live closely together and learn from each other traditionally for example the knowledge of medicinal plants from generation to generation easily, cheaply, non-classically or informally with no teacher in the classes. They have been transferring their knowledge in this way for years, good or bad, weak or strong, correctly or not. It has been a process currently used storing and transferring it fully or not fully to the present, now, it is ours to find a better way out to organize it and to make it better and more complete and try to put it in its right position and condition. It seems that transferring indigenous knowledge of medicinal plants to next generation is so important and should be conducted and performed even in a correct and proper way and methods to save the past and present heritage achieved during the years. The sources available for transferring local knowledge can be as some categories. The category “family in general” combined parents, grandparents, uncles and older familial relatives. “General community” combined elders in the community, neighbors or friends, primary school teachers, traditional healers and spouses. In “other”, we included exogenous sources such as books and newspapers, internet, television, herbal practitioners and academic people (Welz et al., 2018). Other results of the studies presented that, “I learned from my grandmother what she learned from her grandmother. It started with the fact that even as a child, I also drank lime-blossom tea and mint tea. My grandmother always said that these are for the stomach and cough. During summer, the cold lime-blossom tea, then you will not get a cough and, during winter, a hot one, then the flu disappears. From this, I started to investigate further and now I just take everything”. It also claimed that they had learned from book/magazine (10 participants), Parents/grandparents (7), Medicinal expert (7), Friends (3), Education/information event (3) and Trial and error (2) (Weckmüller et al., 2019; Welz et al., 2018). All these results are consistent with our study results and confirm it.

Some other findings say that, combining medicinal plants and prescription medications was less common among people whose parents use medicinal plants could indicate that these participants were mirroring the practices they observed from their parents, findings from other studies provide support for a general, cross-cultural trend of greater medicinal plant use and knowledge among older individuals and females (Vujcic and Cohall, 2021). These results are also consistent with our results. Some also indicated that adults revealed significantly higher knowledge than youth ($p=0.002$) and the knowledge was significantly higher among male respondents than females ($p=0.031$). Conclusively, the respondents showed to possess sound indigenous knowledge on conservation and their knowledge varied based on their socio-demographic attributes (Kibonde, 2020). Some say that this indigenous knowledge on traditional medicinal plants is passed on from generation to generation by oral tradition especially to the cultural group (Nuneza et al., 2021). This is also a way of transferring knowledge based on the conditions of the rural areas such as literacy level and traditional culture, but it seems that it should be changed and reformed to make the best use of it anyway. As researched results proved it by stating, “The status and knowledge of medicinal plants vary among villages, mainly due to geographical and social barriers between the villages (Miyamoto et al., 2021). As was discussed and different ideas of

the researches results was presented, we should reach to a point to plan and manage the discussed issues written above to meet a conclusion that is needed and correct.

Conclusion

The native people use medicinal plants to fight the problems they have in illnesses and ailments, as they know and based on the knowledge, they have acquired around them from infancy to oldness times from different sources available around them and in their environment according to the conditions and culture. They learn from different sources and sometime they experience it traditionally but it is not enough in comparing the value of the knowledge about medicinal plants existing in the area and in the minds of the elderly and experienced native people. It needs to be gathered, organized and some plans be taken to document it through the sources available and reserve and save them for the futures to use it well, apply, transfer and take the best use of it as a supplementary and complimentary of synthesizing modern drugs. It seems that documentation of medicinal knowledge, the huge and precious treasure of the far years is important to be saved, preserved before it is lost forever, because of technological and environmental changes happened and is happening in the world today. The sources that native knowledge of medicinal plants is transferred should be recognized and studied to know the weak and strong point of it for future planning and decision making and new and better substitutions and strategies to be able to preserve the old talents, environmental and natural wealth of ours in every corner and region of the country depending on local circumstances in the research areas. The men of responsible should understand the concerns of transferring knowledge and urge the elders for transferring knowledge to the youth.

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Conflict of interest

The authors declare no conflicts of interest.

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