

Intergenerational Differences in Ethnobotanical Information: A Case Study from Dolakha District, Nepal

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ABSTRACT

The younger generation's increasing disconnection from their cultural roots and traditional practices has led to a decline in the transmission of valuable ethnobotanical knowledge. This study was carried out in Dolakha District to see if there are significant differences in number of plants known, identifying number of plants, number of known plants for ailments treated and number of plant species whose parts to be collected known across different generations: Young generation (15-30 years), mid-generation (31-50 years), Older generation (>50 years). Also, factors (Education, gender, distance from forest and age) influencing ethnobotanical knowledge were examined. Purposive sampling was used and key informants (n=8) were interviewed to list and document plants, their part used and ailment treated in the study area. In total, 72 plant species were documented. Documentation from key informants served as a basis for comparing knowledge across generations. Stratified sampling was carried out. The population was divided into 3 groups: Younger generation (n=40), Mid-generation (n=40) and Older generation (n=40). ANOVA test was applied. Alternative hypothesis was accepted indicating significant differences in number of plants known, identifying number of plants, number of known plants for ailments. In average, young generation can identify 19.825 fewer plants than the middle generation and 29.825 fewer plants than Old generation. In average, Number of Plants Whose Parts to Be Collected Known by young generation was 18.400 lesser than Middle generation and 29.500 lesser than Old generation. The average Number of Plants Known for Medicinal Use by Young generation was 20.400 less than that of middle generation and 30.775 lesser than Old generation. The difference in knowledge across generations shows that if the traditional medicinal knowledge tends to decrease over generations in such a way, there is high threat in loss of such knowledge from entire community. This discrepancy indicated a disconnection of younger generation from traditional ethnobotanical knowledge. The reliance on oral traditions fully without documentation results risk of losing such invaluable ethnobotanical knowledge as older generations pass away.

KEYWORDS: Ethnobotany, Ethnobotanical knowledge, medicinal plants, ailments, Intergenerational

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1. INTRODUCTION

In Nepal, Traditional knowledge is usually held by the Vaidhyas (traditional healers) and elderly people, majorly transmitted *via* verbal communication therefore documentation is still lagging (Upriety et al., 2011). The undocumented plant knowledge of indigenous peoples could lead to the loss of the traditional practice of using diverse plant resources. Therefore, it is essential to document knowledge of the distribution and use of medicinal plants and plants having high cultural significance (Kunwar et al., 2022). The traditional knowledge may decline with loss in interest from the younger generation (Ahoyo et al., 2023). Most of the researches are only limited to documentation of ethnobotanical knowledge and empirical analysis of factors contributing to the decline of such

knowledge is lacking (Atreya et al., 2018). The traditional knowledge may be lost, influenced by migration, modernization, globalization, acculturation and market integration (Ahoyo et al., 2023; Aswani et al.; 2018). Hence, the study documented essential medicinal plants of the area, examined factors influencing ethnobotanical knowledge and displayed intergenerational differences in traditional medicinal plant knowledge.

2. METHODS AND MATERIALS

The study was conducted in Jiri Municipality of Dolakha district, Nepal. The municipality has 57.7% of total area covered by forest and is rich in medicinal plants.

For the documentation of ethnobotanical knowledge

regarding the use of medicinal plants to treat different ailments, Purposive sampling was applied. Individuals who have in-depth knowledge of plants were considered as Key informants (Vaidya) (n=8). Data collected from key informants served as a basis for the comparison of knowledge across generations. To examine the difference in knowledge level, stratified sampling was carried out. The population was divided into subgroups/ strata: old generation, mid- generation and young generation. Individuals were randomly selected from each stratum. Total number of respondents selected from each age class was 40. ANOVA was applied to see if there are significant differences in terms of Number of Plant Respondents Can Identify, Number of plant whose parts to be

collected known and Number of plants known for medicinal use across 3 generations: Young aged (18–35 years), middle-aged (36–55 years) and older aged (>55 years) (Petry, 2002). Correlation was applied to see how ethnobotanical knowledge changes with different factors such as age, gender, distance from forest etc. Outcomes were presented as frequencies, pie charts, and bar graphs.

3. RESULTS AND DISCUSSIONS

RESULTS

3.1.1 Documentation of ethnobotanical knowledge

Table 1. Documentation of ethnobotanical knowledge

S.No.	Botanical name	Local name	Habit	Family	Part used	Ailment treated
1	<i>Abies spectabilis</i>	Talis patra	Tree	Pinaceae	Leaf	Asthma, Cough, Common cold, Digestion, Fever,
2	<i>Acorus calamus</i>	Bojho	Herb	Acoraceae	Root	Asthma, Common cold, Cough, Headache, skin problem, Ulcer
3	<i>Agapetes serpens</i>	Totorke	Herb	Ericaceae	Root, Bark	Clear stomach, Digestion
4	<i>Ageratina adenophora</i>	Banmara	Herb	Asteraceae	Leaf	Wounds, diabetes, inflammation, blood clotting, fever, jaundice, dysentery
5	<i>Allium sativum</i>	Bhotelasun	Herb	Amaryllidaceae	Bulb	Lower blood pressure, stomach ache, fight infections, wound, cancer
6	<i>Aloevera</i>	Ghiukumari	Herb	Asphodelaceae	Leaf	Burn, sugar, gastric, Acnes, Hairfall
7	<i>Anemone</i>	Tinpate	Herb	Ranunculaceae	Root	Throat infection, cancer, ear problems
8	<i>Argentina lineate</i>	Mulapate	Herb	Rosaceae	Root	Throat infection, gastric, ragat masi
9	<i>Arisaema</i>	Bako	Herb	Araceae	Tuber	Gano, clear stomach, wound
10	<i>Artemisia indica</i>	Titepati	Herb	Asteraceae	Shoot	Diarrohea, Dysentery, Worms, allergy
11	<i>Asparagus racemosus</i>	Kurilo	Herb	Asparagaceae	Root	Milk quantity, Immunity, Constipation, Cold
12	<i>B. asiatica</i>	Chutro	Shrub	Berberidaceae	Leaf, Fruit	Purify blood, fever, cough
13	<i>Bergenia ciliate</i>	Pakhenbed	Herb	Saxifragaceae	Rhizome	Piles, body pain, Fever, Cough, Diarrohea
14	<i>Betula utilis,</i>	Bhojpatra	Tree	Betulaceae	Leaf	Inflammation, cough
15	<i>Buddleja asiatica</i>	Bhimsenpati	Tree	Scrophulariaceae	Root, Leaf	Pneumonia, fever, diarrohea
16	<i>Cannabis sativa</i>	Gaja	Herb	Cannabaceae	Leaf	Reduce pain, relaxation
17	<i>Centella asiatica</i>	Ghodtapre	Herb	Apiaceae	Whole plant	Neck, cough, fever, wounds
18	<i>Choerospondias axillaris</i>	Lapsi	Tree	Anacardiaceae	Seed	Burns, Heart condition
19	<i>Cinnamomum glaucescens</i>	Sughandakokila	Tree	Lauraceae	Fruit	Antiseptic, cough, common cold
20	<i>Cinnamomum tamala</i>	Tejpat	Tree	Lauraceae	Leaf	Cough, cold, menstral pain
21	<i>Cinnamomum glanduliferum</i>	Nepal camphorwood	Tree	Lauraceae	Leaf	Common cold, inflammation, cough
22	<i>Cirsium verutum</i>	Sugure kanda	Herb	Asteraceae	Root	Skin problem, jaundice, fever
23	<i>Citrus medica</i>	Bimiro	Tree	Rutaceae	Root	Head ache, stomach pain, parasites
24	<i>Curcuma caesia</i>	Kalo haledo	Herb	Zingiberaceae	Rhizome	Gastric, cancer,
25	<i>Curcuma augustifolia</i>	Besar	Herb	Zingiberaceae	Rhizome	Throat, common cold
26	<i>Cuscuta reflexa</i>	Aakashbeli	Climber	Convolvulaceae	Whole plant	Jaundice, headache, stomachache
27	<i>Cynodon dactylon</i>	Dubo	Herb	Poaceae	Whole plant	Bleeding
28	<i>Dactylorhiza hatagirea</i>	Panchaule	Herb	Orchidaceae	Tuber	Asthma, liver, kidney, dandruf, stomach pain
29	<i>Datura stramonium</i>	Dhaturo	Herb	Solanaceae	Fruit	Teeth pain, infertility
30	<i>Ficus auriculata</i>	Nimaro	Tree	Moraceae	Leaf	Diarrohea, dysentery, Wounds, diabetes
31	<i>Gaultheria fragrantissima</i>	Macchino	Shrub	Ericaceae	Leaf	Joints pain
32	<i>Hydrocotyle nepalensis</i>	Firkejhar	Herb	Apiaceae	Leaf	Snake bite
33	<i>Imperata cylindrical</i>	Siru	Herb	Poaceae	Root	Intestine disorder, diabetes

34	<i>Ixeridium</i>	Kanpate	Herb	Asteraceae	Whole plant	Ear infection
35	<i>Laetiporus sulphureus</i>	Rato chhau	Fungi	Polyporaceae	Fruit	Blood stool, sugar, pressure
36	<i>Leucosceptum canum</i>	Ghurmis	Tree	Lamiaceae	Leaf	Throat pain
37	<i>Lindera neesiana</i>	Siltimur	Tree	Lauraceae	Fruit	Gastric, indigestion
38	<i>Morella esculenta</i>	Kafal	Tree	Myricaceae	Fruit	Gastric
39	<i>Nardostachys grandiflora</i>	Jatamasi	Herb	Caprifoliaceae	Root	Jaundice
40	<i>Neopicrorhiza scrophulariifolia</i>	Kutki	Herb	Scrophulariaceae	Rhizome	Sugar, fever, jaundice, digestion
41	<i>Ocimum tenuiflorum</i>	Tulasi	Herb	Lamiaceae	Leaf	Cough, common cold
42	<i>Ophiocordyceps sinensis</i>	Yarsagumba	Fungi	Ophiocordycipitaceae	Whole Plant	Asthma, cough, cancer
43	Orchids	Sunkhari	Herb	Orchidaceae	Root	Skin burns, bones
44	<i>Oroxylum indicum</i>	Totala	Tree	Bignoniaceae	Bark, Seed	Pneumonia
45	<i>Oxalis corniculata</i>	Chariamilo	Herb	Oxalidaceae	Whole plant	Piles, eye infection, wound
46	<i>Paris polyphylla</i>	Satuwa	Herb	Melanthiaceae	Tuber	Fever, liver, throat
47	<i>Pinus roxburghii</i>	Khote salla	Tree	Pinaceae	Leaf	Insecticide, cuts and wounds
48	<i>Pouzolzia sanguinea</i>	Chiple	Herb	Urticaceae	Leaf	Urine blockade
49	<i>Prunus cerasoides</i>	Paiyu	Tree	Rosaceae	Seed, Leaf	Fracture, stone in kidney
50	<i>Quercus semecarpifolia</i>	Khasru	Tree	Fagaceae	Gall	Diarrhoea, dysentery, muscle pain
51	<i>Rauvolfia serpentina</i>	Sarpagandha	Shrub	Apocynaceae	Root	Snake bite, high blood pressure, heart problems
52	<i>Rhododendron arboretum</i>	Laliguras	Tree	Ericaceae	Root, Flower	Clear throat, Diarrhea
53	<i>Rhododendron campanulatum</i>	Chimal	Tree	Ericaceae	Root, Flower	Body pain, throat pain
54	<i>Rheum austral</i>	Padamchal	Herb	Polygonaceae	Root	Joint pain, body pain, stomach ache
55	<i>Rubia manjith</i>	Majitho	Climber	Rubiaceae	Shoot	Blood purify, inflammation
56	<i>Rubus ellipticus</i>	Aiselu	Shrub	Rosaceae	Shoot	Pneumonia, cough, fever, ulcer, diabetes
57	<i>Rumex nepalensis</i>	Halhale	Herb	Polygonaceae	Root	Ringworm, stomach ache
58	<i>Solena amplexicaulis</i>	Golkakro	Climber	Cucurbitaceae	Root	Throat pain, stomach ache, digestion
59	<i>Solena heterophylla</i>	Bankakro	Climber	Cucurbitaceae	Root	Throat pain, common cold, fever
60	<i>Stellaria media</i>	Maurijhar	Herb	Caryophyllaceae	Leaf	Wounds
61	<i>Swertia chirayta</i>	Chiraito	Herb	Gentianaceae	Whole plant	Sugar, pressure, fever, headache, body pain
62	<i>Tagetes erecta</i>	Sayapatri	Herb	Asteraceae	Leaf, Stem, Flower	Pneumonia, stomach, burn urine
63	<i>Taxus wallichiana</i>	Lauth salla	Tree	Taxaceae	Shoot	Cough, cancer, gastric
64	<i>Terminalia bellerica</i>	Barro	Tree	Combretaceae	Leaf, Bark, Fruit	Cough, throat, asthma
65	<i>Terminalia chebula</i>	Harro	Tree	Combretaceae	Fruit	Diarrhoea, cholesterol
66	<i>Trigonella foenum-graecum</i>	Methi	Herb	Leguminosae	Seed, Leaf	Cold, Diabetes
67	<i>Urtica dioica</i>	Sisnu	Herb	Urticaceae	Leaf	Bone fracture, sugar
68	<i>Valeriana jatamansi</i>	Sugandhawal	Herb	Valerianaceae	Root	Urinary problem, cutting
69	<i>Viola</i>	Kaløjhar	Herb	Violaceae	Whole plant	Cuts
70	<i>Viscum articulatum</i>	Harchur	Herb	Santalaceae	Whole plant	Bone fracture, Muscle pain
71	<i>Zanthoxylum acanthopodium</i>	Timur	Tree	Rutaceae	Fruit	Toothache, stomach clear
72	<i>Zingiber officinale</i>	Adhuwa	Herb	Zingiberaceae	Rhizome	Cough, common cold

3.1.2 Correlation of distance from forest and Traditional Medicinal Plant Knowledge

Table 2. Distance from forest and ethnobotanical knowledge

Correlations					
		Distance from forest	Number of plants they can identify	Number of plant whose parts to be collected known	Number of plants known for medicinal use
Distance from forest	Pearson Correlation	1	-.384**	-.363**	-.281**
	Sig. (2-tailed)		.000	.000	.002
	N	120	120	120	120
Number of plants they can identify	Pearson Correlation	-.384**	1	-.973**	.946**
	Sig. (2-tailed)	.000		.000	.000
	N	120	120	120	120

Number of plant whose parts to be collected known	Pearson Correlation	-.363**	.973**	1	.931**
	Sig. (2-tailed)	.000	.000		.000
	N	120	120	120	120
Number of plants known for medicinal use	Pearson Correlation	-.281**	.946**	.931**	1
	Sig. (2-tailed)	.002	.000	.000	
	N	120	120	120	120
**. Correlation is significant at the 0.01 level (2-tailed).					

Correlation with Number of Plants They Can Identify (-0.384): There is a moderate negative correlation, suggesting that as the distance from the forest increases, the number of plants individuals can identify decreases. This could imply that people who live closer to forests have more opportunities to learn about and recognize plants.

Correlation with Number of Plants Whose Parts to be Collected is Known (-0.363): Again, there is a moderate negative correlation, indicating that greater distance from the forest is

associated with knowing fewer plants whose parts can be collected.

Correlation with Number of Plants Known for Medicinal Use (-0.281): This correlation is weaker but still negative, implying that the further away people are from forests, the fewer medicinal plants they are likely to know about.

3.1.3 Correlation between Age class of respondents and ethnobotanical knowledge

Table 3. Age class of respondents and ethnobotanical knowledge

Correlations					
		Age class	Number of plants they can identify	Number of plants whose parts to be collected known	Number of plants known for medicinal use
Age class	Pearson Correlation	1	.876**	.893**	.900**
	Sig. (2-tailed)		.000	.000	.000
	N	120	120	120	120
Number of plants they can identify	Pearson Correlation	.876**	1	.973**	.946**
	Sig. (2-tailed)	.000		.000	.000
	N	120	120	120	120
Number of plant whose parts to be collected known	Pearson Correlation	.893**	.973**	1	.931**
	Sig. (2-tailed)	.000	.000		.000
	N	120	120	120	120
Number of plants known for medicinal use	Pearson Correlation	.900**	.946**	.931**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	120	120	120	120
**. Correlation is significant at the 0.01 level (2-tailed).					

Strong positive correlations of age with other variables: Number of plants they can identify (0.876), Number of plant whose parts to be collected known (0.893) and Number of plants known for medicinal use (0.900) suggests that as age

class increases, the ability to identify plants, knowledge of plant parts useful for collection, and knowledge of medicinal plants also increase.

3.1.3 Gender and ethnobotanical knowledge

Table 4: Gender and ethnobotanical knowledge

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Number of plants they can identify	Equal variances assumed	.315	.575	-2.550	118	.012	-6.411	2.514	-11.389	-1.432
	Equal variances not assumed			-2.563	111.887	.012	-6.411	2.501	-11.366	-1.455
Number of plant whose parts to be	Equal variances assumed	.116	.734	-1.560	118	.121	-3.868	2.480	-8.778	1.043
	Equal variances			-1.558	109.421	.122	-3.868	2.483	-8.788	1.052

collected known	not assumed									
Number of plants known for medicinal use	Equal variances assumed	.508	.478	-1.886	118	.062	-4.820	2.556	-9.882	.242
	Equal variances not assumed			-1.904	113.445	.059	-4.820	2.532	-9.836	.196

For Number of Plants, They Can Identify: $t = -2.550$, $p = .012$: The p-value is less than 0.05, indicating a statistically significant difference in the means of the two groups. The mean difference of -6.411 indicates that, on average, one group could identify about 6.411 fewer plants than the other.

For Number of Plants Whose Parts to Be Collected Known: $t = -1.560$, $p = .121$: The p-value is greater than 0.05, indicating no statistically significant difference. The mean difference of -3.868 suggests a difference in knowledge about parts, but we

cannot conclude there's a significant difference.

For Number of Plants Known for Medicinal Use: $t = -1.886$, $p = .062$: The p-value of 0.062 is slightly above the cutoff, indicating a trend toward significance but not statistically significant according to traditional levels. The mean difference of -4.820 indicates that Male knows about 4.820 fewer medicinal plants on average.

3.1.5 Education and ethnobotanical knowledge

Table 5. Education and ethnobotanical knowledge

Correlations		Education	Number of plants they can identify	Number of plant whose parts to be collected known	Number of plants known for medicinal use
Education	Pearson Correlation	1	-.488**	-.520**	-.461**
	Sig. (2-tailed)		.000	.000	.000
	N	108	108	108	108
Number of plants they can identify	Pearson Correlation	-.488**	1	.973**	.946**
	Sig. (2-tailed)	.000		.000	.000
	N	108	120	120	120
Number of plants whose parts to be collected known	Pearson Correlation	-.520**	.973**	1	.931**
	Sig. (2-tailed)	.000	.000		.000
	N	108	120	120	120
Number of plants known for medicinal use	Pearson Correlation	-.461**	.946**	.931**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	108	120	120	120

Education and Plant Identify: -.488** means there is a moderate negative correlation between education level and the ability to identify plants. As education increases, the ability to identify plants tends to decrease, or vice versa. This relationship is statistically significant ($p < 0.01$).

Education and Part Collect Known: -.520** shows a moderate negative correlation. Greater education seems to relate to a

lower knowledge or ability in collecting specific known parts of plants, which is statistically significant.

Education and Number of Diseases Treated: -.461** indicates a moderate negative correlation as well, suggesting that higher education levels might correlate with fewer diseases treated, and this finding is also statistically significant.

Table 6. Analysis of Variance between Age groups

ANOVA						
		Sum of Squares	Df	Mean Square	F	Sig.
Number of plants they can identify	Between Groups	18434.150	2	9217.075	227.023	.000
	Within Groups	4750.175	117	40.600		
	Total	23184.325	119			
Number of plant whose parts to be collected known	Between Groups	17760.267	2	8880.133	255.948	.000
	Within Groups	4059.325	117	34.695		
	Total	21819.592	119			
Number of plants known for medicinal use	Between Groups	19612.017	2	9806.008	302.274	.000
	Within Groups	3795.575	117	32.441		
	Total	23407.592	119			

Table 7. Multiple comparisons

Multiple Comparisons						
Tukey HSD						
Dependent Variable	(I) Age class	(J) Age class	Mean	Std.	Sig.	95% Confidence Interval

			Difference (I-J)	Error		Lower Bound	Upper Bound
Number of plants they can identify	15-30	31-50	-19.825*	1.425	.000	-23.21	-16.44
		>50	-29.825*	1.425	.000	-33.21	-26.44
	31-50	15-30	19.825*	1.425	.000	16.44	23.21
		>50	-10.000*	1.425	.000	-13.38	-6.62
	>50	15-30	29.825*	1.425	.000	26.44	33.21
		31-50	10.000*	1.425	.000	6.62	13.38
Number of plants whose parts to be collected known	15-30	31-50	-18.400*	1.317	.000	-21.53	-15.27
		>50	-29.500*	1.317	.000	-32.63	-26.37
	31-50	15-30	18.400*	1.317	.000	15.27	21.53
		>50	-11.100*	1.317	.000	-14.23	-7.97
	>50	15-30	29.500*	1.317	.000	26.37	32.63
		31-50	11.100*	1.317	.000	7.97	14.23
Number of plants known for medicinal use	15-30	31-50	-20.400*	1.274	.000	-23.42	-17.38
		>50	-30.775*	1.274	.000	-33.80	-27.75
	31-50	15-30	20.400*	1.274	.000	17.38	23.42
		>50	-10.375*	1.274	.000	-13.40	-7.35
	>50	15-30	30.775*	1.274	.000	27.75	33.80
		31-50	10.375*	1.274	.000	7.35	13.40

*The mean difference is significant at the 0.05 level.

Number of Plants They Can Identify:

15-30 vs. 31-50: The 15-30 age group can identify 19.825 fewer plants than the 31-50 age group.

15-30 vs. >50: The 15-30 age group can identify 29.825 fewer plants than the >50 age group.

31-50 vs. >50: The 31-50 age group identifies 10.000 fewer plants than the >50 age group.

Number of Plants Whose Parts to Be Collected Are Known:

15-30 vs. 31-50: The younger age group knows 18.400 fewer plants compared to the 31-50 age group.

15-30 vs. >50: The 15-30 age group knows 29.500 fewer plants compared to the >50 age group.

31-50 vs. >50: The 31-50 group knows 11.100 fewer than the >50 group.

Number of Plants Known for Medicinal Use:

15-30 vs. 31-50: The younger group knows 20.400 fewer medicinal plants compared to the middle age group.

15-30 vs. >50: The 15-30 age group knows 30.775 fewer than the >50 age group.

31-50 vs. >50: The middle age group knows 10.375 fewer than the >50 group.

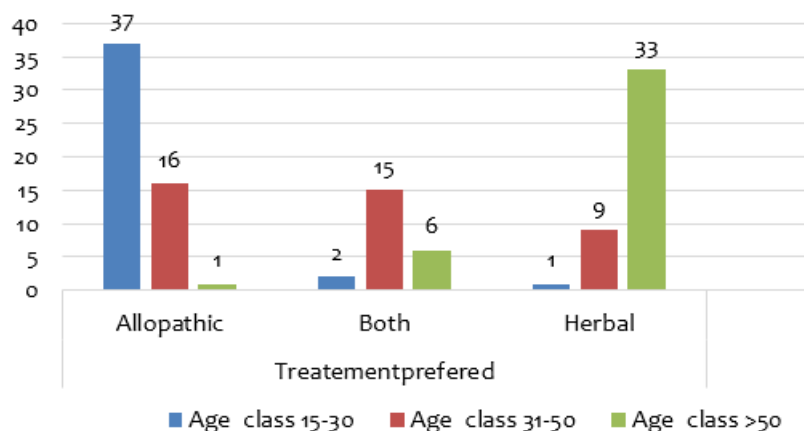


Figure 1: Treatment Preferred by respondents of different age class

3.1.6 Treatment Preferred by respondents of different age class

Out of total 40 respondents, 37 respondents from Age class 15-30 preferred Allopathic treatment, 1 respondent preferred Herbal treatment and 2 respondents preferred both the treatments. Similarly, 16 out of 40 respondents from Age class

31-50 preferred Allopathic treatment, 9 preferred Herbal and 15 preferred both the treatments. 1 respondent from Age class >50 reported preferences on Allopathic treatment, 33 respondents preferred herbal treatment and 6 preferred both the treatment.

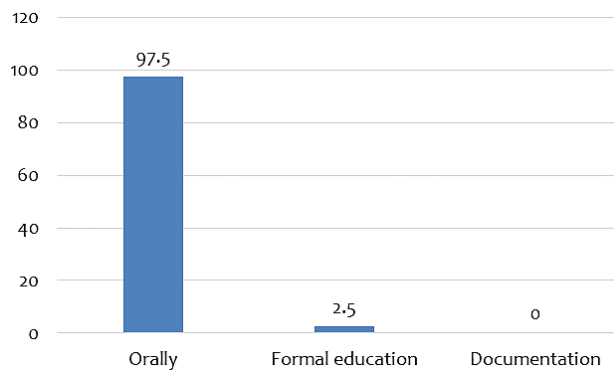


Figure 2: Knowledge transmission mechanism

3.1.7 Knowledge transmission mechanism

As shown in figure 7, 97.5% respondents responded that they

acquired ethnobotanical knowledge orally whereas 2.5% of respondents acquired knowledge through formal education.

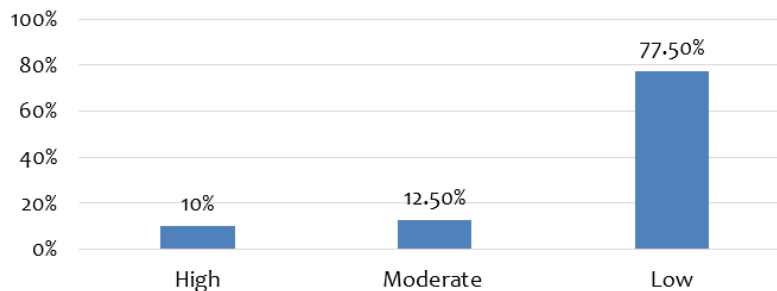


Figure 3: Interest to learn traditional healing practices

Discussions

In total, 72 medicinal plant species belonging to 47 plant families were documented. Plants were categorized into 8 ailments categories. Metabolic disorder (9), Gastrointestinal (32), respiratory (26), dermatological (20), Poisonous bites (2), skeletomuscular (14), cardiovascular (7), Genitourinary (8) and Sensory nerve (8).

Correlation of distance from forest with respect to Number of Plants Respondent Can Identify, Number of Plants Whose Parts to be Collected is Known, Number of Plants Known for Medicinal Use were (-0.281) (-0.384) (-0.363) respectively. It indicated that which increase in distance from forest, Number of Plants Respondent Can Identify, Number of Plants Whose Parts to be Collected is Known, Number of Plants Known for Medicinal Use tends to decrease. This could imply that people who live closer to forests have more opportunities to learn about and recognize plants. (Kutal et al., 2021) in his study stated that Gurung having greater ethnobotanical knowledge in comparison to other communities might be because of their frequent access to the forest.

Strong positive correlations of age with other variables: Number of plants they can identify (0.876), Number of plants whose parts to be collected known (0.893) and Number of plants known for medicinal use (0.900) suggests that as age class increases, the ability to identify plants, knowledge of plant parts useful for collection, and knowledge of medicinal plants also increase. This might be because they have accumulated high knowledge with interaction from different people and experiences. It is similar to the finding by (Aparicio and Silveira Funch, 2021) where he stated that knowledge and use of plants increases with increase in age.

T test for gender revealed that Number of Plants Respondent Can identify ($t = -2.550, p = .012$): differ significantly in the means of the two groups. For Number of Plants whose Parts to Be Collected Known: $t = -1.560, p = .121$: No significant difference yet the mean difference of -3.868 suggests female know on average 3.688 number of plants whose part is collected for medicine. For Number of Plants Known for Medicinal Use: $t = -1.886, p = .062$ indicates no significant differences but the mean difference of -4.820 indicates that female knows about 4.820 more medicinal plants on average. This might be because of their greater involvement in cutting grass from forest, cooking with fire woods, caring children with herbal medicines and having strong community networks. Female having more knowledge may be because they are more involved and also, they communicate more with their friend circles. Married women often have more plant knowledge as they can learn more about different species of different areas. Similar finding was presented by (Ahoyo et al., 2023) where he discovered that women had higher Ethnobotanical Knowledge Index values than men.

Negative correlation between education with respect to Plant Respondents Can Identify (-.488**), Number of plants whose parts to be collected known (-.520**) and Number of plants known for medicinal use (-.461**) indicates that as education increases knowledge towards traditional medicine decreases.

In average, young generation can identify 19.825 fewer plants than the middle generation and 29.825 fewer plants than Old generation. In average, Number of Plants Whose Parts to Be Collected Known by young generation was 18.400 lesser than Middle generation and 29.500 lesser than Old generation. The average Number of Plants Known for Medicinal Use by Young generation was 20.400 less than that of middle generation and

30.775 lesser than Old generation. The difference in knowledge across generations shows that if the traditional medicinal knowledge tends to decrease over generations in such a way, there is high threat in loss of such knowledge from entire community.

97.5 % respondents responded that they acquired ethnobotanical knowledge orally whereas 2.5 % of respondents acquired knowledge through formal education. Whereas, no respondents reported documentation. This increases the likelihood of such knowledge being lost over time.

Only 15% of respondents reported their involvement in Medicinal plants. Most of the families noted they have to struggle in fulfilling their basic needs. They prefer activities which provide them with high financial return. They do not rely only on traditional healing practices as it does not contribute to financial benefits.

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Young generation are not interested to learn about medicinal plants as they are not familiar about medicinal plants significances.

Conclusion

Younger generation displayed a concerning gap in the number of plants known, identifying number of plants, number of known plants for ailments. This discrepancy suggests a disconnection of them from traditional ethnobotanical knowledge. The reliance on oral traditions fully without documentation results risk of losing such invaluable ethnobotanical knowledge as older generations pass away. Decline in ethnobotanical knowledge within younger generation's shows that there is a critical need for sudden measures to preserve this essential knowledge.

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Author Contributions

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