

Material and Methods

A questionnaire of 20 questions was prepared to determine the use of medicinal and aromatics plants in Eskişehir. The ethic committee of Anadolu University approved to apply the survey. It was applied to randomly selected 641 people from various occupational groups who were over 18. The survey was analyzed by SPSS Software 19.0. It was conducted to evaluate the views of people in Eskişehir towards medicinal and aromatic plants. The results obtained were subjected to two samples t-test to determine whether there was difference in the given scores between males and females as well as among the groups with children and without children in the frequency of herbal products usage. One way variance analysis was applied to determine the difference in the given scores of the frequency of usage between groups of age, levels of education and marital status. A chi-square test was used to determine whether there was a relationship between the variable of how and when the herbal products are provided and the variables of gender, marital status, age, level of education, level of income.

Results and Discussion

The socio-economic status of the participants surveyed during this study revealed that 61.3% were females (363) and 38.7% males (248), 61.8% married and 32.1% single, 6.1% divorced or widowed, 55.9% with children, 11.7% aged 18 to 25, 33.2% aged 26 to 35, 28.9% aged 36 to 45, 16.2% aged 46 to 55, and 10% were aged older than 56. The level of education of the participants showed 12% had simply primary school certificates, 16.5% had high School diplomas, 27.5% possessed bachelors degree and 44% were holding M.S. or Ph.D. degree. Only one person had not attended the school. The level of income of the participants in terms of Turkish Lira (TL) was as follows; 11.5% earned less than 500 TL, 15.6% earned between 500-1.000 TL, 14% earned 1.000-1.500 TL, 20.9% earned 1.500-2.000 TL, and 37.9% earned more than 2.000 TL.

Participants were asked to write the usage of medicinal and aromatic plants. The survey showed 35% actually watched the usage of medicinal and aromatic plants and 64.9% did not. Out of the participants bearing

children, 63.9% used herbal products for their children as well. Examining the way how and when the participants are using the herbal products, it came out that the maximum number of participants (30.6%) were getting information from internet, 22.5% from newspapers, books and television, 18.7% from friends or family members, 10% from pharmacists or any other related person, 8.6% from herbalists, and 9.7% from all sources mentioned above. The answers to the frequency of the herbal products usage in daily life were; 45.7% of the participants used sometimes, 23.9% used rarely, 19.7% used oftenly, 6.7% used always, and 4% never used herbal products. As for the procurance of herbal products 77.2% obtained from herbalist, 41% from markets/bazaar, 4.2% from pharmacy and 11.5% of the participants wrote that they collected the plants from nature. The ways of the consumption of the medicinal and aromatic plants were; 25.4% as food supplement and puree, 95.2% as tea supplement, 5% as mash food, 12.9% as cream/gel, and 2.2% as raw meal. The consumption time of herbal tea was 6.9% at breakfast in the mornings, 15.8% after dinner, 38.8% 1-2 times during the day, 38.5% only when there was sickness. As regards the results of the reason why the herbal products were preferred; 93.4% mentioned for healthy life, 15.4% for loosing weight, 11.4% for beauty, and 0.8 % other reasons, and most of them wrote that they enjoyed it. As to the side effects of herbal products, 78.3% mentioned that they had no effect, 10.5% wrote they had perspiration, 6.6% had allergic effects, and 2.5% had other effects. The data of the frequency of usage of some plants is given in Table 1.

The most often used plants were lime, mint and thyme; anise, lemon balm, and flaxseed were used the least. 50.2% of the participants in the survey indicated they would prefer to join a workshop about the medicinal and aromatic plants usage. Since the p-value is less than 0.05, Table 2a reveals that there is difference between female and male groups in usage frequency of herbal products. Table 2b reveals that two groups, people with children and those without child did not differ from each other in usage frequency of herbal products. To investigate usage frequency of herbal products in different groups of age, education level and marital status, one way Analysis of Variance (ANOVA) has been done and results are given Table 3a-d.

Table 1. The frequency of usage of some plants.

Plant	Never		Rare		Sometimes		Often		Always	
	Count	%	Count	%	Count	%	Count	%	Count	%
Anise	501	78,2	79	12,3	42	6,6	16	2,5	3	0,5
Salvia	75	11,7	193	30,1	222	34,6	120	18,7	31	4,8
Mint	58	9,0	114	17,8	183	28,5	182	28,4	104	16,2
Thyme	87	13,6	119	18,6	146	22,8	195	30,4	94	14,7
Lime	29	4,5	57	8,9	211	32,9	251	39,2	93	14,5
Sesame	271	42,3	113	17,6	133	20,7	88	13,7	36	5,6
Flaxseed	369	57,6	130	20,3	84	13,1	37	5,8	21	3,3
Lemon balm	401	62,6	108	16,8	89	13,9	22	3,4	21	3,3

Table 2a. Results of independent 2-sample t-test.

Gender	Mean	t	p
Female	3,13	4,028	0,000
Male	2,83		

Table 2b. Results of independent 2-sample t-test.

Grup	Mean	T	p
With child	3,05	1,290	0,198
Without child	2,96		

Table 3a. ANOVA results for marital status groups who answered 'How often do they use herbal products in Daily life.'

Source of variability	Sum of squares	Degrees of freedom	Mean sum of squares	F-value	p-value	Significant groups
Between groups	3,737	2	1,869	2,163	0,116	No
Within groups	551,186	638	0,864			
Total	554,924	640				

Table 3b. ANOVA results for education level groups who answered 'How often do they use herbal products in Daily life.'

Source of variation	Sum of squares	Degrees of freedom	Mean sum of squares	F-value	p-value	Significant groups
Between groups	14,080	3	4,693	5,528	0,001	Primary school master/Ph.d
Within groups	540,843	637	0,849			
Total	554,924	640				

Table 3c. ANOVA results for age groups who answered 'How often do they use herbal products in Daily life.'

Source of variation	Sum of squares	Degrees of freedom	Mean sum of squares	F-value	p-value	Significant groups
Between Groups	2,895	4	0,724	0,834	0,0504	No
Within Groups	552,029	636	0,868			
Total	554,924	640				

Table 3d. ANOVA results for income groups who answered 'How often do they use herbal products in Daily life.'

Source of variability	Sum of squares	Degrees of freedom	Mean sum of squares	F-value	p-value	Significant groups
Between groups	9,463	4	2,366	2,758	0,027	Less than 500TL 1000-1500TL- 1500-2000 TL 1000-1500TL-above 2000 TL
Within groups	545,461	636	0,858			
Total	554,924	640				

Turkish Lira (TL)

Chi-square test results are given in Table 4 to answer if there is relationship between gender, marital status, age, education level, income level and source of the information that explains when and how to use herbal products by the citizens (Question 8). Pearson Chi-square test results reveal that different groups of gender and marital status are not related with question 8, because the p values are bigger than 0.05. On the other hand the variables related with question 8 are given in the form of contingency Tables in 5a-c.

In the Table 5a, we see that most of the people learn about the use of herbals from internet particularly those between the age groups 18-25, 26-35, and 36-45 years. On the other hand, since use of computer is not common for elderly people, internet is not the first source for this group. Among the highly educated groups most people

learn about the medicinal and herbal plants from the internet, followed by newspapers, books, TV, friends, and family members as other sources in this group. Table 5c also reveals that most people learn when and how to consume herbal from the internet in the first place and Herbal shops are the source used least.

According to Bařer *et al.*, (1986) in one of the herbal plant shops in Eskiřehir more than 200 kinds of herbal plants are sold. The most commonly used were okra seed, rosemary, blackberry root, tamarind, rose hips, chamomille, melissa, st. John's wort and ginger. Out of these rosemary leaf and tamarind together are good for liver disorders, if nigelle solid oil is mixed with honey it is good for blood vessel disorders. The same study also reveals that consumption of one spoon of nigelle seed oil for one month gives relief for the digestion problems.

Table 4. Chi-square test results for the relationship between gender, marital status, age, education level, income level, and source of information.

Variables	Pearson Chi-square test value	Degrees of freedom	p-value
Gender-Question 8	9,511	5	0,090
Marital status-Question 8	15,528	10	0,114
Age-Question8	64,425	20	0,000
Education level-Question 8	62,725	15	0,000
Income level-Question 8	54,290	20	0,000

The survey results have shown that *Ecballium elaterium* is used for sinusitis. Other information from the survey depicts that pepper mint, aniseed, chamomille, mastix and ginger are the most commonly used herbals for the digestion system today as they were used in the past (Qasim *et al.*, 2010). Besides these herbals; thyme, st. John's wort, senna, parsley, linseed, everlasting flower, liquorice root, mamordica, carob, lavender, nigelle seed, rosemary, apricot, yarrow, mallow, commonnettle, melissa, and cinnamomum are also used for the digestion system by the citizens of Eskişehir. Flos lavandule romanae is used most for the heart disease problems today. Flos lavandule romanae and marjoram were also used mostly in the past. Addition to this melissa, walnut, sage, hawthorn leaf, artichoke, thyme, lime, nut, redish, devil's clove, melissa, st. John's wort, mistletoe, red onion and green tea are also used for the treatment of heart problems. Blueberry, cinnamomum, and thyme are the most commonly used herbals by diabetic people. Other herbs used for diabetes are nigella seed, peppergrass, ginger, couch grass, chamomille, artichoke, olive its leaf, rose hips, basil, hawthorn, okra seed, flos lavandula romanae, milk thistle, melissa, linseed, cabbage, pomegranate and its flower, parsley, mistletoe, peach seed, green apple, and yam. Başer *et al.*, (1986) have pointed out that for the same disease people also used mahaleb, leaf of melissa, hammal seed, black mulberry leaves, aniseeds, senna and mustard in the past.

Most of the people who participated in the survey declared that they used lime and sage for the cold relief together with mixture of mint and lemon, rosemary, rose hips, chamomille, ginger, green tea, turmeric, jasmine, nettle reed, aniseed, laurel berry, mallow, onion, grapefruit, salep, blueberry, thyme, quince leaf, blackberry, elder flower, and piment. *Smilax* root is used for decoction with seven spices and sold by the herbal shops in Eskişehir. Use of walnut and linseed for the cholesterol is the signal that the citizens of Eskişehir are following the recent literature from the media. The survey results also revealed that chamomille was commonly used for the cholesterol. No information about the plants used for **cholesterol** in the past was provided. In the past, people were using mistletoe for the hypertension, but today garlic and lemon are preferred by most of the people

besides mistletoe. In addition to these sage, rosemary, nettle, thyme, cabbage, parsley, melissa, chamomille, st. John's wort, and lavender are also used for the hypertension.

Survey results showed that for the allergic diseases, nigella seed, marshmallow flower, artichoke, nettle, carob, parsley, onion, oats, normal seed, and olive oil were used by the citizens of Eskişehir. Mostly Aloe and st. John's wort are used nowadays at the first place for burns and wounds together with almond oil, blackberry, sesame, nettle, tea tree, lemon, and olive oil (Sarwat *et al.*, 2012). Thyme is used to get relief from the menstruation; black mulberry for the intra-oral wound; sage, jasmine, chamomille, nettle, st. John's wort for the pain relief; wheat starch for pharyngitis; cherry stalk, corn silk, parsley for urinary tract infections; rosemary and senna for the constipation; celery, artichoke to protect liver against fat, rosemary for migraine; st. John's wort to alleviate joint pain, nettle for rheumatism; melissa, lavender, chamomille, and basil herb for stress, rosemary and chamomille for sinusitis, apricot, swelling, and edema for acne, cinnamomum; fennel, ginger for flatulence; walnut, dill, basil herb, fennel, melissa, peppergrass for thyroid, chamomille, melissa for sleep disturbances, ginger for fatigue, linseed for losing weight. These are the most commonly used medicinal herbal plants. In the light of our findings, 77 plants were used by the citizens of Eskişehir. We noticed that thyme, sage, melissa, nettle, rosemary, chamomille, linseed, cinnamomum, st. John's wort, and ginger were most preferred ones. Although nettle causes skin irritation, people continue to use it for the burns and wounds, showing that people are using some herbals without considering their side effects. Nearly 50.2% of the participants have showed willingness to be trained on the usage of herbal plants.

It is surprising that only 77 herbal plants are used in Eskişehir although there are approximately 1000 taxa, 200 being endemics. This proves that there is an awareness among the citizens about the herbals and their benefits, and people are using very limited number of herbs. We believe that this study will help to pass down the experience from one generation to another.

Table 5a. Contingency table between age and Question 8.

		Source of information obtained for the usage of herbal plants					Total	
		Internet	Newspaper, book, tv	Friend, family	Pharmacy	Herbalist		Other
18-25	Frequency	40	12	14	5	3	1	75
	Expected frequency	22,9	16,8	14,0	7,5	6,4	7,3	75,0
	% in Age	53,3%	16,0%	18,7%	6,7%	4,0%	1,3%	100,0%
	% in Q8	20,4%	8,3%	11,7%	7,8%	5,5%	1,6%	11,7%
	% in total	6,2%	1,9%	2,2%	0,8%	0,5%	0,2%	11,7%
26-35	Frequency	75	42	34	24	15	23	213
	Expected frequency	65,1	47,9	39,9	21,3	18,3	20,6	213,0
	% in Age	35,2%	19,7%	16,0%	11,3%	7,0%	10,8%	100,0%
	% in Q8	38,3%	29,2%	28,3%	37,5%	27,3%	37,1%	33,2%
	% in total	11,7%	6,6%	5,3%	3,7%	2,3%	3,6%	33,2%
Age 36-45	Frequency	55	40	35	10	18	27	185
	Expected frequency	56,6	41,6	34,6	18,5	15,9	17,9	185,0
	% in Age	29,7%	21,6%	18,9%	5,4%	9,7%	14,6%	100,0%
	% in Q8	28,1%	27,8%	29,2%	15,6%	32,7%	43,5%	28,9%
	% in total	8,6%	6,2%	5,5%	1,6%	2,8%	4,2%	28,9%
46-55	Frequency	21	28	21	14	12	8	104
	Expected frequency	31,8	23,4	19,5	10,4	8,9	10,1	104,0
	% in Age	20,2%	26,9%	20,2%	13,5%	11,5%	7,7%	100,0%
	% in Q8	10,7%	19,4%	17,5%	21,9%	21,8%	12,9%	16,2%
	% in total	3,3%	4,4%	3,3%	2,2%	1,9%	1,2%	16,2%
56+	Frequency	5	22	16	11	7	3	64
	Expected frequency	19,6	14,4	12,0	6,4	5,5	6,2	64,0
	% in Age	7,8%	34,4%	25,0%	17,2%	10,9%	4,7%	100,0%
	% in Q8	2,6%	15,3%	13,3%	17,2%	12,7%	4,8%	10,0%
	% in total	0,8%	3,4%	2,5%	1,7%	1,1%	0,5%	10,0%
Total	Frequency	196	144	120	64	55	62	641
	Expected frequency	196,0	144,0	120,0	64,0	55,0	62,0	641,0
	% in Age	30,6%	22,5%	18,7%	10,0%	8,6%	9,7%	100,0%
	% in Q8	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
	% in total	30,6%	22,5%	18,7%	10,0%	8,6%	9,7%	100,0%

Table 5b. Contingency table for education level and Question 8.

	Source of the information obtained for usage of herbal plants						Total
	Internet	Newspaper, book, tv	Friend, family	Pharmacy	Herbalist	Other	
Frequency	9	21	21	7	17	2	77
Expected frequency	23,5	17,3	14,4	7,7	6,6	7,4	77,0
1* % in Education	11,7%	27,3%	27,3%	9,1%	22,1%	2,6%	100,0%
% in Q8	4,6%	14,6%	17,5%	10,9%	30,9%	3,2%	12,0%
% in total	1,4%	3,3%	3,3%	1,1%	2,7%	,3%	12,0%
Frequency	46	23	19	4	10	4	106
Expected frequency	32,4	23,8	19,8	10,6	9,1	10,3	106,0
2* % in Education	43,4%	21,7%	17,9%	3,8%	9,4%	3,8%	100,0%
% in Q8	23,5%	16,0%	15,8%	6,3%	18,2%	6,5%	16,5%
% in total	7,2%	3,6%	3,0%	0,6%	1,6%	0,6%	16,5%
Frequency	46	45	36	19	13	17	176
Expected frequency	53,8	39,5	32,9	17,6	15,1	17,0	176,0
3* % in Education	26,1%	25,6%	20,5%	10,8%	7,4%	9,7%	100,0%
% in Q8	23,5%	31,3%	30,0%	29,7%	23,6%	27,4%	27,5%
% in total	7,2%	7,0%	5,6%	3,0%	2,0%	2,7%	27,5%
Frequency	95	55	44	34	15	39	282
Expected frequency	86,2	63,4	52,8	28,2	24,2	27,3	282,0
4* % in Education	33,7%	19,5%	15,6%	12,1%	5,3%	13,8%	100,0%
% in Q8	48,5%	38,2%	36,7%	53,1%	27,3%	62,9%	44,0%
% in total	14,8%	8,6%	6,9%	5,3%	2,3%	6,1%	44,0%
Frequency	196	144	120	64	55	62	641
Expected frequency	196,0	144,0	120,0	64,0	55,0	62,0	641,0
Total % in Education	30,6%	22,5%	18,7%	10,0%	8,6%	9,7%	100,0%
% in Q8	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
% in total	30,6%	22,5%	18,7%	10,0%	8,6%	9,7%	100,0%

*: 1,Primary school; 2, High school; 3,College; 4, Master-Ph.D

Table 5c. Contingency table for income level and Question 8.

		Source of the information for the usage of herbal plants					Total	
		Internet	Newspaper, book, tv	Friend, family	Pharmacy	Herbalist		Other
	Frequency	27	14	19	6	6	2	74
	Expected frequency	22,6	16,6	13,9	7,4	6,3	7,2	74,0
1*	% in income	36,5%	18,9%	25,7%	8,1%	8,1%	2,7%	100,0%
	% in Q8	13,8%	9,7%	15,8%	9,4%	10,9%	3,2%	11,5%
	% in total	4,2%	2,2%	3,0%	0,9%	0,9%	0,3%	11,5%
	Frequency	37	29	18	5	9	2	100
	Expected frequency	30,6	22,5	18,7	10,0	8,6	9,7	100,0
2*	% in income	37,0%	29,0%	18,0%	5,0%	9,0%	2,0%	100,0%
	% in Q8	18,9%	20,1%	15,0%	7,8%	16,4%	3,2%	15,6%
	% in total	5,8%	4,5%	2,8%	0,8%	1,4%	0,3%	15,6%
	Frequency	21	25	16	12	13	3	90
	Expected frequency	27,5	20,2	16,8	9,0	7,7	8,7	90,0
Income 3*	% in income	23,3%	27,8%	17,8%	13,3%	14,4%	3,3%	100,0%
	% in Q8	10,7%	17,4%	13,3%	18,8%	23,6%	4,8%	14,0%
	% in total	3,3%	3,9%	2,5%	1,9%	2,0%	0,5%	14,0%
	Frequency	31	27	31	15	15	15	134
	Expected frequency	41,0	30,1	25,1	13,4	11,5	13,0	134,0
4*	% in income	23,1%	20,1%	23,1%	11,2%	11,2%	11,2%	100,0%
	% in Q8	15,8%	18,8%	25,8%	23,4%	27,3%	24,2%	20,9%
	% in total	4,8%	4,2%	4,8%	2,3%	2,3%	2,3%	20,9%
	Frequency	80	49	36	26	12	40	243
	Expected frequency	74,3	54,6	45,5	24,3	20,9	23,5	243,0
5*	% in Age	32,9%	20,2%	14,8%	10,7%	4,9%	16,5%	100,0%
	% in Q8	40,8%	34,0%	30,0%	40,6%	21,8%	64,5%	37,9%
	% in total	12,5%	7,6%	5,6%	4,1%	1,9%	6,2%	37,9%
	Frequency	196	144	120	64	55	62	641
	Expected frequency	196,0	144,0	120,0	64,0	55,0	62,0	641,0
Total	% in income	30,6%	22,5%	18,7%	10,0%	8,6%	9,7%	100,0%
	% in Q8	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
	% in total	30,6%	22,5%	18,7%	10,0%	8,6%	9,7%	100,0%

*: 1) Less than 500 TL; 2) 500-1.000; 3) 1.000-1.500; 4) 1.500-2.000; 5) more than 2.000

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