

Nutrition and Health Conditions of Beekeepers in Turkey: A Pilot Study

Meltem SOYLU^{1*}, Mehmet SÖNMEZ², Sibel SİLİCİ²

¹Biruni University, Faculty of Health Sciences, Department of Nutrition and Dietetic, İstanbul, TURKEY

²Erciyes University, Faculty of Agriculture, Department of Agricultural Biotechnology
Agriculture Research Unit, Kayseri, TURKEY

* Corresponding author e-mail: meltemboh@gmail.com

Received: 21th April, 2021; accepted: 18th June, 2021; published: 15th July, 2021

A B S T R A C T

The apiculture sector turned to be a fast-growing commercial field but beekeepers requiring strenuous efforts and arduous work were not addressed adequately in terms of job safety, health, and nutrition. This study is to assess the conditions of nutrition, health and job safety in the context of a pilot study. This cross-sectional and descriptive study was carried out using a survey and observation on 276 stationary and migratory beekeepers registered with the Kayseri Beekeepers Association in 14 districts of Kayseri, in the context of a pilot study. The study ascertained that beekeepers had in general a low level of income, 44,9% of beekeepers were suffering from chronic diseases and only 24,6% of beekeepers had regular health checks. Risky health behaviors were common among beekeepers. 19,8% of migratory beekeepers declared that their health conditions were affected negatively and 39,6% stated that their psychology was adversely influenced on performing this profession. Also, beekeepers were troubled by challenges in terms of water and food security. The study proposes the establishment of a system in which, as in the case of other fields of work, beekeepers would be offered economic, health, and nourishment support, be provided with safe working conditions and have access to periodic health examinations.

Keywords: Beekeeping, health status, nutritional status, stationary beekeepers, migratory beekeepers, work safety

Introduction

Apiculture (beekeeping) turned to be a sector that experienced tremendous progress and contributed to the economies of countries with a significant commercial

value. 486.568 tons of honey that worth 464.166.019.000 Euros were exported in the world in 2017 [1]. In 2017, with the production of 551 thousand tons of honey,

China ranked the first in the world whereas Turkey ranked the second [2]. According to the Turkish Statistical Institute, 114.471 tons of honey was produced in Turkey and 1.236 tons of honey worth 24.720.000 Dollars were exported from Turkey in 2017 [3].

Apiculture is not primarily based on agricultural land and so can act as a source of income for rural dwellers with insufficient agricultural land. Moreover, it can be said that it is the only agricultural activity that can inexpensively and effortlessly create employment. However, apiculture is practiced in a vast geographical landscape, extending from low lands at sea level to plateaus that are thousands of meters high, and in distant regions from residential areas. This situation makes apiculture an arduous endeavor and causes honey collection to be performed in harsh and socially isolated conditions. In this process, beekeepers are challenged with quite a few problems. On top of that, migratory beekeepers need to relocate the apiary to different regions, and this relocation requires sacrifice and efforts to be made at specific time intervals throughout the entire year.

The regulation on apiculture released by the Ministry of Agriculture and Forestry of Turkey addressed the ‘Terms and

Conditions of Migratory Apiculture’ and endeavored to solve such problems as safety and accommodation of beekeepers in Turkey [4]. However, it is argued that meeting basic needs such as nutrition and healthcare is still a matter of critical importance.

However, it is possible to find several scientific research on apiculture and honey bee products in the literature. Nevertheless, researches that assess the working conditions of beekeepers practicing apiculture as a profession and so are directly in charge of the production of honey and bee products are almost inexistent.

The aim of this research is to assess nutrition, health, and job safety conditions of stationary and migratory beekeepers around the environs of Kayseri in where no sufficient knowledge before. The reason why this province was chosen as a pilot region is that Kayseri is a province rich in flowers and suitable for beekeeping with its rich flora.

Environs of Kayseri mainly happen to be on the migratory apiculture route extending from around Mersin province on the coast of the Mediterranean Sea to the provinces of East Anatolia and Black Sea regions of Turkey.

Additionally, as there is no previous research on this region, the results of this research will likely contribute to the

development of apiculture as a profession and set an example to other regions where apiculture is practiced.

Materials and Methods

In the form of descriptive research, this study was conducted in Kayseri province and its environs from July 1, 2016, to July 1, 2017.

The study included 180 stationary beekeepers and 96 migratory beekeepers, all of whom were registered to Kayseri Beekeepers Association, and who were from Yahyalı, Develi, Tomarza, Pınarbaşı, Sarız, Bünyan, Hacılar, Özvatan, Yeşilhisar, Sarioğlan, İncesu, Melikgazi, Kocasinan and Talas districts of Kayseri. Approximately 380 beekeepers from these districts were registered to the Kayseri Beekeepers Association and 73% of them were reached in the study.

Research data were collected by a team of 3 students who studied at the Agricultural Biotechnology Department of Agriculture Faculty of Erciyes University, Kayseri, and instructed about research techniques and application of surveys before the research.

Just as noted in the regulation of the Ministry of Agriculture and Forestry of

At the beginning of the research, the necessary permission was obtained from the department where the study was conducted and Kayseri Beekeepers Association and it was carried out according to the working principles of TUBITAK2204. 'Informed Consent Form for Human Volunteers' was prepared in full compliance with the Declaration of Helsinki for each beekeepers taking part in the research voluntarily and written approvals of beekeepers were received.

Through the face-to-face interview technique, the research team applied the survey form composed of questions on socio-demographic characteristics, general health conditions, medical backgrounds, health checks, health-aware eating habits, and specifics of health conditions of beekeepers to collect research data. The height was measured by the beekeepers' statement, and the weight was measured with a portable Tanita scale.

Turkey on apiculture, migratory beekeepers refers to those who relocate their bee

colonies to benefit from different blooming periods of plants to the full extent and to protect their bees from winter conditions whereas stationary beekeepers relates to those who keep their bee colonies at the same location all through the year [4].

Data were analyzed using IBM SPSS Statistics 15.0 (IBM Corp., Armonk, New York, USA). While analyzing the data, as descriptive statistical methods; a number of units (n) and percentage (%) in qualitative

parametric variables; In the comparison of categorical/qualitative variables, "Chi-square" or "Fisher's Exact" tests were used according to the suitability of the data; Bonferroni correction was applied in the Post-Hoc complementary analyzes performed to determine the differences. In all statistical analyses, the "Confidence Interval" (Confidence Interval or CI) was 95% and a $p < 0.05$ value was considered statistically significant.

Results and Discussion

The general characteristics of the beekeeping enterprises were given in Table 1. Beekeepers taking part in the research had an overall mean age of 51 ± 12 years old (<30 years 5,1%; 31-50 years 39,1%; >51years 55,3%) The mean age of beekeepers is usually above 50 years as noted in other studies conducted in Turkey [5-7]. This may suggest that apiculture is

more practiced as a profession by elder members of society. The fact that apiculture is more preferred by the old generation rather than the young generation does not only jeopardize the transfer of apiculture as a profession to the next generations and its sustainability in the future but also raises health risks as chronic diseases to increase along with age.

Table 1. General characteristics of beekeepers

	Beekeepers				Total		χ^2	p
	Stationary		Migratory		n	%		
Education	n	%	n	%	n	%		
Primary School	110	61,1	50	52,1	160	58	5,334	0,149

Secondary School	18	10,0	17	17,7	35	12,7		
High School	25	13,9	18	18,8	43	15,6		
University	27	15,0	11	11,5	38	13,8		
Profession								
Only Apiculture	21	11,7	58	60,4	79	28,6	72,830	0,000
Others	159	88,3	38	39,6	197	71,4		
Retiree	70	44,0	19	50,0	89	45,2	3,308	0,191
Farmer	28	17,6	10	26,3	38	19,3		
Others*	61	38,4	9	23,7	70	35,5		
Income (Turkish Liras)**								
With no regular income	18 [#]	10,0	65	67,7	83	30,1	106,117	0,000
Below minimum wage	103 [#]	57,2	21	21,9	124	44,9		
Above minimum wage	59	32,8	10	10,4	69	25		
Total	180	100	96	100	276	100		

*: These consist of civil servants, shopkeepers, worker, and who do not have a regular job or work with their families.

** : In 2016 when the research was carried out, Net Minimum Wage was 1.300.99 Turkish Liras, and 1 Dollar was equal to 2.9322 Turkish Liras (Central Bank of Turkey).

: Post-Hoc Analysis, $p < 0,05$

The fact that all beekeepers in this study were males implies that apiculture is carried out as a male-dominated business. On the other hand, it is a generally acknowledged fact that the number of females engaged in apiculture gradually increases, and the women are actively involved in apiculture

even though they are still less involved than males [8]. For instance, women make 17.5% of beekeepers in Ardahan, an eastern province of Turkey [9].

This study demonstrates that apiculture is preferred more often as an additional income. Retirees and farmers prefer

apiculture, and members of each profession successively make 45,2% and 19,3% of beekeepers participating in the study. Also, 44,6% of beekeepers reported that their incomes were below the minimum wage, and 30,1% of beekeepers claimed that they did not have a regular source of income and this percentage was 67,7% for migratory beekeepers ($p < 0,05$) (Table 1).

Apiculture is a vital agricultural activity that has high economic value and whose products are traded locally and globally. On the other hand, it is a field of work engaged primarily by individuals with low socioeconomic status in society. This study exhibits that beekeepers have low socioeconomic status too. 58% of beekeepers said that they were primary school graduates, 30,1% of them declared that they had no regular income and almost half of them (44,9%) remarked that their monthly income was below the minimum wage ($p < 0,05$) (Table 1).

As a repercussion of the capitalist economic system, individuals with low socioeconomic status tend to make efforts in the beekeeping business but earn a low level of income from honey production despite their endeavors. However, apiculture is still perceived as a source of hope for alleviating poverty. A study conducted in Tanzania ascertained that the

average income of individual beekeepers was 856 Dollars (639 Euros) in 2009 and argued that apiculture buttressed the alleviation of poverty and the struggle to earn a living [10]. In a study performed to promote the development of apiculture as a profession, it was decided that there would be a 10% increase in income per capita for the poorest households with a net annual profit of 389 Dollars in Nueva Esperanza, Lima, Peru [11]. Besides, it was discerned that tens of thousands of households earned 25% of their annual income through the trade of honey and beeswax in Zambia and beekeepers increased their annual household income by 100-400 Dollars by selling honey and beeswax [12]. An economic analysis conducted in Africa found that a farmer could make an annual net income of 85.70 Dollars per beehive [13].

Today, the relationship between income, social inequality, and health risks is indisputably revealed. Whichever socioeconomic indicators (such as income, social class, poverty level, and education level) are taken into consideration, those who are challenged socioeconomically are faced with risks and poor health conditions [14,15].

Non-communicable diseases are the leading global causes of death. They strike

hardest at the low- and middle-income populations of the world and are preventable through the reduction of behavioral risk factors such as tobacco use, physical inactivity, harmful use of alcohol, and unhealthy diet [16].

Risky health behaviors were common among beekeepers. More than half of beekeepers (53,6%) were overweight, 98,2% of beekeepers did no physical exercise regularly, and 41,7% of beekeepers smoked. 65,2% of the smoker

beekeepers were heavy smokers and smoked 20-25 cigarettes per day. 40,8% of beekeepers alleged that they increased smoking more during beekeeping activity. The percentage of smokers raising the number of cigarettes smoked during beekeeping activity was even higher for stationary beekeepers and reduced smoking during beekeeping activity ($p < 0,05$) (Table 2).

Table 2. Behaviors of beekeepers to healthcare

	Beekeepers				Total		χ^2	p
	Stationary		Migratory		n	%		
BMI*	n	%	n	%	n	%	4,617	0,032
Normal	57	31,7	39	21,6	96	34,8		
Overweight	105 [#]	58,3	43	44,8	148	53,6		
Obese	18	10,0	14	14,6	32	11,6		
Total	180	100	96	100	276	100		
Doing exercise regularly**								
Yes	5	2,8	-	-	5	1,8	5,162 ^a	0,66
No	175	97,2	96	100,0	271	98,2		
Total	180	100	96	100	276	100		
Alcohol consumption								
No	179	99,4	92	95,8	271	98,2	a	0,051
Yes	1	0,6	4	4,2	5	1,8		
Total	180	100	96	100	276	100		
Smoking (in number of cigarettes)								

Never	71 [#]	39,4	56	58,3	127	46,0	8,945 ^a	0,020
Constantly	85 [#]	47,2	30	31,2	115	41,7		
Occasionally	2	1,1	-	-	2	0,7		
Quitted despite smoking previously	22	12,2	10	10,5	32	11,6		
Total	180	100	96	100	276	100		
Number of cigarettes smoked per day								
3-5	3	3,5	1	3,3	4	3,5	20,778	0,236
10-20	23	27	3	10,0	26	22,6		
20-30	54	63,6	21	70,0	75	65,2		
30 and above	5	5,9	5	16,7	10	8,7		
Total	85	100	30	100	115	100		
Smoking during beekeeping activity								
Yes	76	89,4	27	90	103	89,6	a	0,177
No	9	10,6	3	10	12	10,4		
Total	85	100	30	100	115	100		
Smoking during beekeeping activity								
Smoking more	28	36,8	14	51,9	42	40,8	7,617 ^a	0,017
Smoking less	48 [#]	63,2	13	48,1	61	59,2		
Total	76	100,0	27	100	103	100		

*: BMI: Body Mass Index <https://www.euro.who.int/en/health-topics/disease-prevention/nutrition/a-healthy-lifestyle/body-mass-index-bmi>

** : Moderate physical activities for a minimum of 150 minutes per week.

Source: https://hsgm.saglik.gov.tr/depo/birimler/saglikli-beslenme-hareketli-hayat-db/Turkey_Dietary_Guidelines_2015.pdf

^a:Fisher's exact test

[#]: Post-Hoc Analysis, p<0,05

The Labor class that also includes beekeepers are threatened by risks in society and it is necessary to pay particular attention to their

nutrition. A sufficient and well-balanced diet has significant implications on both the health of workers and the enhancement of their work

performance. In connection with the job which they are occupied with, workers need to have access to nourishment that is satisfactory in terms of amount and quality. If the nutritional needs of workers are not met properly, the efficiency and production pace of workers are likely to decrease and the risk of getting a chronic disease increases for them. A study by International Labor Organization indicated that a 1% increase in daily calorie intake by a worker increased his/her productivity by 2.27% [17]. This study displayed that the eating habits of beekeepers were adversely affected. The number of meals decreased and instead, they tended to consume more snacks, especially during beekeeping activities. Stationary beekeepers said they skipped meals because they could not find enough time, and migrant beekeepers said they had lack of sufficient meals (respectively 86,1% and 87%) (Table3).

They consumed foodstuff brought from home and tried to content themselves with homemade food during beekeeping activity. Although homemade food was the most preferred choice in their routine life, particularly migratory beekeepers tended to consume canned food, bakery, and pastry

products and frequently had to have breakfast as toasted sandwiches and pastry during beekeeping activities. Access to clean drinking water was also an important problem for beekeepers. Beekeepers met this need with natural spring water or transported water (Table 3). Nevertheless, this type of nourishment has a high potential to offer risks based on the issue of food safety besides the sufficiency of its amount and quality. Beekeepers should be able to obtain an adequate amount of calories and nutrients necessary for performing activities efficiently through their diets, they should have 3 meals and 1-3 snacks per day, there should be milk, ayran, lemonade, herbal tea, fruit juice, different types of sandwiches, cakes, biscuits, pastry, bakery, fruit, walnut, hazelnut, dried fruit in their meal boxes, and the sufficient consumption of antioxidant vitamins, minerals, and herbal chemicals should be ensured during the day through the daily intake of diverse types of fruit and vegetable [18].

Table 3. As a result of apiculture changing nutritional status in the apiary

	Types of Beekeepers								Total			
	Stationary				Migratory				In Routine Life		During beekeeping activity	
	In Routine Life		During beekeeping activity		In Routine Life		During beekeeping activity					
	n	%	n	%	n	%	n	%	n	%	n	%
Number of main meals												
Two	11	6,2	59	32,8	10	10,4	37	38,5	21	7,6	96	32,4
Three	169	93,8	121	67,2	86	89,6	59	61,5	255	92,4	200	67,6
Number of snacks												
Never	38	21,1	32	17,8	21	21,9	13	13,5	59	21,4	45	16,3
One	79	43,9	80	44,4	35	36,4	26	27,1	114	41,4	106	38,4
Two	56	31,1	62	34,5	36	37,5	50	52,1	92	33,3	112	40,6
Three and above	7	3,9	6	3,3	4	4,2	7	7,3	11	3,9	13	4,7
Most frequently skipped meal(s)												
Breakfast and dinner	7	3,9	6	3,3	1	2	2	2,1	8	2,9	8	2,9
Lunch	150	83,3	153	85	89	92,7	88	91,7	239	86,6	241	87,3
Snacks	23	12,8	21	11,7	6	6,3	6	6,2	29	10,5	27	9,8
Reason for a skipped meal(s)												

Lack of sufficient time	148	82,2	155	86,1	84	3,1	1	1,1	232	84,1	156	56,6
Aversion to food	22	12,2	16	8,9	6	6,3	4	4,2	28	10,1	20	7,3
Lack of sufficient meals	3	1,7	4	2,2	3	87,5	87	31,5	6	2,2	91	32,9
Others*	7	3,9	5	2,8	3	3,1	4	4,2	10	3,6	9	3,2
Daily water intake (in water glasses)												
5	14	7,8	4	2,2	2	2,1	-	-	16	5,8	4	1,5
8-12	87	48,3	20	11,1	34	35,4	5	5,2	121	43,8	25	9,1
13-20	74	41,1	122	67,8	48	50	51	53,2	122	44,2	173	62,7
20 and above	7	3,9	32	17,8	13	13,5	39	40,6	20	7,2	71	25,7 39
Source for meeting the water need												
Tap water	177	98,3	7	3,9	91	94,8	10	10,4	268	97,1	17	6,2
Natural spring water	2	1,1	116	64,4	5	5,2	65	67,7	7	2,5	181	65,6
Transported water	1	0,7	57	31,7	-	-	21	21,9	1	0,4	78	28,3
Food consumed at lunch and dinner												
Homemade food	158	87,8	-	-	65	67,7	-	-	223	80,8	-	-
Restaurant food	22	12,2	1	0,7	31	32,3	-	-	53	19,2	1	0,4

Homemade sandwiches, canned food	-	-	173	96	-	-	44	45,8	-	-	217	78,6
Home-made pastry, bakery, etc.	-	-	6	3,3	-	-	52	54,2	-	-	58	21
Total	180	100	180	100	96	100	96	100	276	100	276	100

*: Others pertained to the lack of eating habits and the practice of getting by on fast food.

All stationary and migratory beekeepers have conventional breakfast by consuming tea, cheese, olives, and eggs. Migratory beekeepers stated that they had breakfast mostly by eating toasted sandwiches and pastries during beekeeping activities. Both groups of beekeepers generally preferred bread made of white wheat flour and consumed olive oil. Furthermore, 33,3% of beekeepers added extra salt to their meals without even checking the taste of their

food. 64,4% of stationary beekeepers reported that their eating habits did not change during beekeeping efforts and the rest of them claimed that they began to have unhealthy nutrition. This ratio was even higher for migratory beekeepers (61,5%) ($p < 0,05$) (Table 4). This situation increases the risk of having a chronic disease and has negative effects on the remission of existing diseases.

Table 4. General eating habits of beekeepers

	Beekeepers				Total		χ^2	p
	Stationary		Migratory		n	%		
	n	%	n	%				
Bread consumption							0,135 ^a	1
White bread	167	92,8	89	92,7	256	92,8		
Brown bread	7	3,9	4	4,2	11	3,9		

Whole wheat bread	6	3,3	3	3,1	9	3,3		
Oil consumption								
Butter	27	15	7	7,3	34	12,3	3,844 ^a	0,273
Margarine	4	2,2	2	2,1	6	2,2		
Olive oil	103	57,2	63	65,6	166	60,1		
Vegetable oil	46	25,6	24	25	70	25,4		
Adding extra salt to the food								
Without even tasting the food	64	35,6	28	29,2	92	33,3	1,150	0,284
After tasting the food	116	64,4	68	70,8	184	66,7		
Daily honey consumption (gram)								
25-50	31	17,2	16	16,7	47	17	6,100	0,010
70-100	85	47,2	38	39,6	123	44,6		
150-200	25	13,9	15	15,6	40	14,5		
250 and above	9	5	6	6,3	15	5,4		
No consumption	30	16,7	22	22,8	51	18,5		
Change in eating habits as a result of apiculture								
No change	116 [#]	64,4	37	38,5	153	55,4	9,300	0,010
Irregular consumption of food	27 [#]	15	36	37,5	63	22,8		

Excessive consumption of food	10	5,6	13	13,5	23	8,3		
Insufficient consumption of food	27 [#]	15	10	10,5	37	13,4		
Total	180	100	96	100	276	100		

^a:Fisher's exact test

[#]: Post-Hoc Analysis, $p < 0,05$

Beekeepers taking part in this research are faced with problems akin to those experienced by other beekeepers in Turkey regarding the satisfaction of their basic needs [9, 19-22]. Migratory beekeepers having accommodation and nutrition inconvenient for a healthy life, lack of access to clean drinking water and insufficient hygienic conditions and increase in smoking have negative effects on the health conditions of beekeepers and so can lay the groundwork for the emergence and development of chronic diseases.

Most beekeepers taking part in this study thought that they were healthy enough although almost one-third of them suffered from a critical chronic disease such as hypertension, diabetes and were supposed to use medication regularly, 47,8% of migratory beekeepers were diagnosed with hypertension. Hypertension is the most serious risk factor for ischemic and

hemorrhagic strokes. The risk of having a stroke is three or four times as high for hypertensive patients and one-and-a-half times high for borderline hypertensive patients [23]. Four-fifths of patients suffering from strokes were diagnosed with hypertension [24].

In a similar vein, uncontrolled levels of blood glucose can cause short-term (immediate) or long-term complications and even at times result in death [25]. Fluctuations in blood pressure associated with hypertension or blood sugar due to diabetes can cause serious health problems for migrant beekeepers with chronic illnesses who spend most of the year alone away from home.

Migratory beekeepers participating in this research stated that their health and psychology were also negatively affected because of spending 3-6 months of the year away from home (Table 5).

Table 5. General information on migratory beekeepers

	Migratory Beekeepers	
	n	%
Time spent away from home in a year		
1-2 month(s)	6	6,3
3-6 months	80	83,3
More than 6 months	10	10,4
Total	96	100
Negative effect on health		
Yes	19	19,8
No	77	80,2
Total	96	100
Adverse influence on the psychology		
Yes	38	39,6
No	58	60,4
Total	96	100
Response when faced with a health risk*		
Calling a friend	25	28,4
Creating his solution	63	71,6
Total	88	100
Proposed measure		
Transportation support	27	28,1
Access to clean drinking water	27	28,1
Equipment support	24	25,0
Accommodation support	18	18,8
Total	96	100

Periodic health checks are an indispensable part of for healthcare. However, beekeepers

tend to be insensitive to this fact. Only 24,6% of beekeepers had health checks

regularly, 79,2% of migratory beekeepers did not get regular health checks at all. In addition, stationary beekeepers use their medicines more regularly and more visits to a health facility ($p < 0,05$) (Table 6). Periodic health checks which are effective for reducing morbidity and mortality by identifying risk factors and early symptoms of curable diseases play a critical role in the prevention of workforce loss and deaths. As well as enhancing overall health, the periodic health check is an important

instrument also for measuring the state of a person's satisfaction with his/her job and his/her overall well-being, addressing the hardships experienced by the person, discussing the physical and psychological effects of the job on the person and forwarding the person to a health facility for his/her health issues or referring the person to a specialist physician [26].

Table 6. General state of health of beekeepers and their healthcare behaviors

	Beekeepers				Total		χ^2	p
	Stationary		Migratory		n	%		
Visits to a health facility	n	%	n	%			n	%
6 months ago	137 [#]	76,1	49	51	186	67,3		
7-11 months ago	11	6,1	8	8,3	19	6,8		
1-3 years ago	18 [#]	10	18	18,7	36	13		
More than 3 years ago	14 [#]	7,7	21	21,8	35	12,6		
Self-evaluation of health state								
Good	169	93,9	88	91,7	257	93,1	0,482	0,487
Average	11	6,1	8	8,3	19	6,9		
Existence of a chronic disease								
Hypertension	23	35,4	11	47,8	34	38,6	7,499 ^a	0,357
Diabetes	16	24,6	4	17,4	20	22,7		

Other endocrine diseases	8	12,3	2	8,7	10	11,4		
Cardiovascular diseases	7	10,8	2	8,7	9	10,2		
Musculoskeletal disorders	5	7,7	4	17,4	9	10,2		
Respiratory system diseases	4	6,2	-	-	4	4,5		
Digestive system diseases	2	3,1	-	-	2	2,3		
Total	65	36,1	23	23,8	88	31,9		
Regular use of medication								
Yes	63	35	19	19,8	82	29,7	a	0,009
No	117 [#]	65	77	80,2	194	70,3		
Periodic Health Checks								
Yes	48	26,6	20	20,8	68	24,6	1,142	0,285
No	132	73,4	76	79,2	208	75,4		
Total	180	100	96	100	276	100		

^a:Fisher's exact test

[#]: Post-Hoc Analysis, $p < 0,05$

Therefore, the health conditions of beekeepers can be improved by employing occupational physicians in professional chambers or associations where beekeepers are registered, and by arranging periodic health control for beekeepers. On the other hand, all beekeepers taking part in this research were interested in the organization of awareness promotion activities about healthcare and they wanted to attend a training program on the issue.

In the international conference held by the World Health Organization in Alma-Ata in 1978, it was underlined that all individuals had the right to health, and fulfillment of this right was the most fundamental duty of the governments. In 2008, it was highlighted that health was under the threat of globalization and injustice in income distribution, and the conference stressed the importance of social justice, an extension of the right to health to every human being, participation, equality and solidarity [27].

Promote the health of the workplace and workers in this respect, it is essential to take every measure such as maintaining the social, spiritual, and physical health of beekeepers to the full extent, providing them with healthy working conditions, eliminating risks and offering training and instructions to them just as in the case of other fields of work [28].

Each profession is likely to pose a potential risk to human health. Apiculture is a field of work not only with commercial value but also it is one of the agricultural activities with high risk. Beekeepers are more

Conclusion

Apiculture occupies a strategically significant place in Turkey. Nevertheless, people involved in apiculture are faced with more various difficulties than those experienced by people engaged in agriculture and livestock farming. Beekeepers especially the migratory ones are supposed to live in locations far from family and sociable environs and have trouble having access to a sufficient and well-balanced diet. It is indispensable to provide beekeepers with economic, health, and nourishment support, offer safe working conditions to them and create

frequently challenged with high risks in terms of both healthcare and job safety. This research also ascertained that 13% of beekeepers were confronted with risks such as bee stings, assault by wild animals, robbery, diseases, and terror attacks and forced to deal with these challenges through their means. It is necessary to identify locations convenient for the accommodation of migratory beekeepers at the provincial level, to develop infrastructure such as road, electricity, water, and waste management in these locations, and to build permanent or portable housing units

systems ensuring their periodic health checks.

Acknowledgement

This study was supported by TUBITAK (The Scientific and Technological Research Council of Turkey) 2209/A University Students Domestic Research Projects Support Program in the first semester of 2016.

Türkiye’de Gezginci ve Sabit Arıcıların Beslenme ve Sağlık Durumları: Pilot Çalışma

Öz: Arıcılık sektörü hızla büyüyen bir ticari faaliyet alanı olmasına rağmen, zorlu çaba ve yoğun emekler ile çalışan arıcılar iş güvenliği, sağlığı ve beslenme açısından yeterince ele alınmamıştır. Bu çalışmanın amacı; Kayseri yöresinde sabit ve gezginci arıcılık yapanların beslenme, sağlık ve iş güvenliği durumlarının pilot bir çalışma kapsamında değerlendirilmesidir. Kesitsel ve tanımlayıcı nitelikte olan bu çalışma, Kayseri’ nin 14 ilçesinde, Kayseri Arıcılar Birliğine kayıtlı 276 sabit ve gezginci arıcı üzerinde anket ve gözlem yolu ile gerçekleştirilmiştir. Çalışmada arıcıların düşük gelir düzeyinde oldukları, %44,9’unda teşhis edilmiş kronik

hastalığın bulunduğu, ancak sadece %24,6’ sinin düzenli olarak sağlık kontrollerini yaptırdığı saptanmıştır. Arıcılar arasında riskli sağlık davranışlarının yaygın olduğu, gezginci arıcıların %19,8’i bu işi yaparken sağlıklarının ve %39,6’i de psikolojilerinin olumsuz yönde etkilendiği belirtilmiştir. Ayrıca suya erişim ve besin güvenliği konusunda sıkıntılar yaşandığı ifade edilmiştir. Arıcıların diğer iş kollarında olduğu gibi, ekonomik, sağlık ve beslenme yönünden desteklenmeleri, güvenli çalışma koşullarının sağlanması ve periyodik sağlık muayenelerinin yapılmasını sağlayacak sistemlerin oluşturulması önerilmektedir.

Anahtar Kelimeler: Arıcılar, beslenme durumu, sağlık durumu, sabit arıcılar, gezginci arıcılar, iş güvenliği.

REFERENCES

- [1] EUROPEAN COMMISSION (2019), Honey Market Presentation, CMO, 2019. Available from: https://ec.europa.eu/info/sites/info/files/food-farmingfisheries/animals_and_animal_products/presentations/market-presentation-honey_en.pdf (02.02.2021)
- [2] MINISTRY of AGRICULTURE and FORESTRY of TURKEY-Tarım ve Orman Bakanlığı (2019). Tarımsal Ekonomi ve Politika Geliştirme Enstitüsü, Tarım Ürünleri Piyasaları, Ürün No: 26, Ankara. Available from: <https://arastirma.tarimorman.gov.tr/tepge/Belgeler/PDF%20Tarim%20Ürünleri%20Piyasaları/2019-Ocak%20Tarım%20Ürünleri%20Raporu/2019-Ocak%20Arıcılık.pdf> (02.02.2021).
- [3] BEEKEEPING STATISTICS (2018), Turkish Standards Institute Available from: http://www.tuik.gov.tr/PreTablo.do?alt_id=1001 (02.02.2021).
- [4] ANONYMOUS (2011) T.C. Cumhurbaşkanlığı, 30 Kasım 2011 tarihli ve 28128 sayılı Resmi Gazete, Available from: <https://www.resmigazete.gov.tr/eskiler/2011/11/201111130.htm> (07.02.2021).
- [5] ÖZTÜRK, GF (2013) Ordu ili Arıcılık Sektörünün Ekonomik Yapısı Üzerine Bir Araştırma [Yüksek Lisans Tezi]. Erzurum: Atatürk Üniversitesi. Available from: <https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp> (02.02.2021).
- [6] AYDIN, A (2014) Ardahan İlinde Arıcılık Faaliyetleri ve Sorunları [Yüksek Lisans Tezi], Erzurum: Atatürk Üniversitesi. Available from: <https://tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp> (07.09.2020).

- [7] ÖZBAKIR, ÖG; DOĞAN, Z; ÖZTOKMAK, A (2016) Adıyaman İli Arıcılık Faaliyetlerinin İncelenmesi. *Harran Tarım ve Gıda Bilimleri Dergisi*, 6;20(2):119-126.
- [8] KAGYA, MA (2014) Beekeeping in Tanzania: Country Situation Paper, ApiExpo Africa, Harare, Zimbabwe, October 2014. Available from: http://www.apitradeafrica.org/Documents/CS_Papers-ApiExpoAfrica2014/Tanzania_Apiculture_Situation_Paper_2014.pdf (02.02.2021).
- [9] KARACA, N; ÖZİNCE, G (2019) Ardahan Arıcılık Sektörü Mevcut Durum Analizi ve Stratejik Eylem Planı, T.C. Serhat Kalkınma Ajansı, Kars, 2019, 31pp.
- [10] MWAKATOBÉ, AR; MACHUM, RM (2019) Beekeeping for Poverty Reduction and Biodiversity Conservation. *Bees for Development Journal* 101,1 6. Available from: http://www.beesfordevelopment.org/media/2693/bfdj101_povertyreduction017.pdf (07.02.2021).
- [11] NUEVAS ESPERANZAS' BEEKEEPING PROJECT PROPOSAL (2012) February, Lima August, Nuevas Esperanzas'. Available from: <https://nuevasesperanzas.org/documents/04%20Concept%20papers%20and%20proposals//Beekeeping%20proposal%202012%20ENG.pdf> (07.02.2021).
- [12] HUSSELMAN, M (2008) Center for International Forestry Research, Forest Livelihood Briefs, Beekeeping in Zambesi, February 2008 Number 7, pp1-4. Available from: https://www.cifor.org/publications/pdf_files/livebrief/livebrief0801.pdf (22.02.2021).
- [13] ANONYMOUS SITUATION ANALYSIS OF BEEKEEPING INDUSTRY (2019) Situation Analysis of the Beekeeping Industry in Botswana, Lesotho, Malawi, Mozambique, South Africa, Swaziland, Zambia and Zimbabwe, Total Transformation Agribusiness (Pty) Ltd, 2019. Available from: https://www.apiservices.biz/documents/articles-en/beekeeping_regional_situational-analysis.pdf (02.02.2021).
- [14] KUNST, AE (1997) Cross-national Comparison of Socio-economic Differences in Mortality, [Ph.D Thesis], Rotterdam: Erasmus University. Available from: [file:///C:/Users/melte/Downloads/970917_KUNST,%20Anton%20Eduard%20\(1\).pdf](file:///C:/Users/melte/Downloads/970917_KUNST,%20Anton%20Eduard%20(1).pdf). (08.02.2021).
- [15] CAVELAARS, AE; KUNST, A; MACKENBACH, JP (1997) Socio-Economic Differences in Risk Factors for Morbidity and Mortality in the European Community: An International Comparison. *Journal of Health Psychology*, 2(3):353-372.
- [16] ALWAN, A (2010) Global Status Report on Noncommunicable Diseases, Italy: World Health Organization Reprinted 2011. Available from: https://www.who.int/nmh/publications/ncd_report_full_en.pdf. (07.02.2021).
- [17] WANJEK, C (2005) Food at work: Workplace Solutions for Malnutrition, Obesity and Chronic Diseases, International Labour Office. Available from: https://www.ilo.org/global/publications/ilo-bookstore/order-online/books/WCMS_PUBL_9221170152_EN/lang-en/index.htm (07.02.2021).
- [18] TURKEY DIETARY GUIDELINES (2016) Ministry of Turkey Health Publication No: 1046, Ankara, Türkiye, 59 pp.
- [19] SÖĞÜT, B; ŞEViŞ, HE; KARAKAYA, E; İNCİ, H (2019) Arıcılık İşletmelerinde Mevcut Durum, Temel Sorunlar ve Çözüm Önerileri Üzerine Bir Araştırma (Bingöl ili Örneği). *Uludağ Arıcılık Dergisi*, 19(1):50-60.
- [20] ÖZTÜRK, İA (2017) Muğla İli Ula İlçesi Arıcılığının Bazı Teknik Özelliklerinin Belirlenmesi. *Hayvansal Üretim*, 58(2):52-57.
- [21] SIRALI, R (2017) Ordu Arıcılığının Başlıca Sorunları ve Çözüm Yolları, *Uludağ Arıcılık Dergisi*, 17(1):35-43. Available from: <https://dergipark.org.tr/tr/download/article-file/397041> (07.02.2021).
- [22] DEMEN, H (2015) Diyarbakır İlinde Arıcılığın Yapısı ve Sorunların Belirlenmesi Üzerine Bir Araştırma [Yüksek Lisans Tezi], Aydın: Adnan Menderes (07.02.2021).
- [23] BALKAN, S; TOPÇUOĞLU, MA (2004) İnme ve Hipertansiyon. *Türkiye Klinikleri Journal of Neurology*, 2(1):41-7.
- [24] NAZLIEL, B (2010) İnme ve Hipertansiyon. In 12.Ulusal Hipertansiyon ve Böbrek Hastalıkları Kongresi, Antalya, Türkiye, 20-22 Mayıs 2010. Available from: <http://www.turkhipertansiyon.org/kongre2010/Bijen%20NAZLIEL.pdf> (22.02.2021).
- [25] OLGUN, N (2002) Diyabet Hemşireliği Temel Bilgiler Kitabı, Diyabet Hemşireliği Derneği, İstanbul, TR, 106 pp.
- [26] BAŞCIL, H (2001) İş Hekimliği ve İşyeri Sağlık Servisleri, Bölüm3: İş Yeri Sağlık Servisinin Çalışmaları, Türk Tabipler Birliği Yayını, Ankara, TR. pp. 24.
- [27] RAWAF, S; DE MAESENEER, J; STARFIELD, B (2008) From Alma-Ata to Almaty: A New Start for Primary Health Care. *Lancet*, 18;372(9647):1365-7.
- [28] OĞAN, H (2014) Sağlık Çalışanları İçin İşçi Sağlığı ve Güvenliği. *Türk Tabipler Birliği Yayını*; Ankara, TR, 7-22 pp.