



Cigarette Addiction in Flight Personnel and Coping Methods with Nicotine Deficiency during Flight

Uçuş Personelinde Sigara Bağımlılığı ve Uçuş Sırasında Nikotin Eksikliği ile Başa Çıkma Yöntemleri

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ABSTRACT

Objectives: Smoking is an addictive habit used by many people of all ages and occupations. Smoking adversely affects users physically, spiritually, socially and economically. Airline companies implement policies to ban smoking. Flight performance may be reduced in flight personnel, especially in pilots who smoke. Studies on smoking are limited in cabin crew, pilot and other flight crew personnel. Smoking is prohibited during the flight. In this study, we aimed to evaluate the smoking-related habits of active smokers and quitted flight personnel, especially on long flights dealing with what symptoms they experienced most frequently due to nicotine deficiency during the flight and how they tried to cope with this situation.

Methods: In this study, a questionnaire was applied between May and July 2019 to cabin crew, pilot and other flight crews who fly in Turkey and abroad. The surveys were conducted on a voluntary basis after obtaining the written document approvals at Istanbul Airport, Sabiha Gökçen Airport and İzmir Adnan Menderes Airports at the same time. The criterion of quitting was accepted as no smoking for a year, and as a criterion for smoking, at least one smoking per day was accepted.

Results: This study was conducted with a total of 263 participants. All of the participants were flight personnel and worked as cabin crew, pilot, dispatcher, technician, loadmaster and so on. Nicotine deficiency during the flight was felt in 18.3% of the participants, while 9.9% often felt nicotine deficiency, 47.5% sometimes felt, and 24.3% did not feel nicotine deficiency. The most common factor aggregating the sense of nicotine deficiency during the flight was rituals, including tea and coffee, with a rate of 36.9%. This was followed by long flight times with a rate of 34.6%. Among study participants, 52.1% cope with nicotine deficiency by eating-drinking snack, 35% by suppressing, 9.1% trying to cope by wearing a nicotine band. The most common desire to eat was followed by restlessness and lack of concentration, respectively.

Conclusion: Cigarette addiction is an important problem in flight personnel and may force employees psychologically and diminish their productivity. This research we conducted in this special group aimed to examine the methods of coping with tobacco addiction, and there is a need for research to develop successful tobacco control and quitting methods for similar specific groups.

Keywords: Cigarette addiction; flight personnel; nicotine deficiency.

ÖZET

Amaç: Kabin memuru, pilot ve diğer uçuş ekibi personelinde sigara ile ilgili çalışmalar sınırlıdır. Uçuş sırasında sigara içmek yasaktır. Bu çalışmada, özellikle uzun uçuşlarda sigara içen ve içip bırakan uçuş personelinin sigarayla ilişkili alışkanlıklarını ve uçuş sırasında nikotin eksikliğine bağlı en sık hangi semptomları yaşadıklarını, bu durumla nasıl başa çıkmaya çalıştıklarını yaptığımız anketle değerlendirmek istedik.

Yöntem: Bu çalışmada, ülkemizde Mayıs ile Temmuz 2019 tarihleri arasında farklı havayollarında yurtiçi ve yurtdışı uçuş yapan, kabin memuru, pilot ve diğer uçuş ekibine, yaklaşık üç aylık sürede, birden fazla şıklı anket yapıldı.

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Anket, mail aynı zamanda İstanbul Havalimanı ve Sabiha Gökçen Havalimanı ile İzmir Adnan Menderes havalimanlarında basılı evrak şeklinde onayları alındıktan sonra gönüllülük esasına göre yapıldı. Sigara kullanma kriteri olarak günde en az bir sigara içiyor ya da içmiş olmak; bırakmış olma kriteri olarak da bir yıl süreyle hiç sigara içmemiş olmak kabul edildi.

Bulgular: Çalışma toplam 263 katılımcı ile gerçekleştirilmiştir. Katılımcıların %18.3'ü uçuş esnasında nikotin eksikliği hissetmekte, %9.9'u nikotin eksikliğini sıklıkla hissetmekte, %47.5'i ise bazen hissetmekte, %24.3'ü ise nikotin eksikliği hissetmemekteydi. Uçuş esnasında nikotin eksikliğini hissetmeye en fazla etki %36.9 oran ile çay kahve vb sigarayı hatırlatan ritüeller idi. Bunu %34.6 oranı ile uzun uçuş süresi takip etmekteydi. Katılımcıların %52.1'i nikotin eksikliği ile yeme-içme atıştırma yaparak başa çıkmakta, %35'i baskılayarak, %9.1'i nikotin bandı takarak başa çıkmaya çalışmaktadır. Nikotin eksikliğine bağlı davranış şekli olarak, en sık yeme arzusu gözlenirken bunu sırasıyla huzursuzluk ve konsantrasyon eksikliği takip ediyordu.

Sonuç: Uçuş personelinde sigara bağımlılığı önemli bir sorun olup çalışanları gerek verimlilik gerekse psikolojik olarak zorlayabilir. Bu tanımlı özel grup içinde yaptığımız araştırma tütün bağımlılığı ile baş etme yöntemlerini incelemeyi amaçlamış olup benzer spesifik gruplar için başa- rılı tütün kontrol ve terk yöntemlerinin geliştirilmesi amacıyla araştırmalara ihtiyaç vardır.

Anahtar sözcükler: Sigara bağımlılığı; uçuş personeli; nikotin eksikliği.

Tobacco use is a preventable cause of death and disability in developed and developing countries around the world.^[1] Nicotine, the primary active substance that is addictive in smoking, acts on nicotine receptors in the central nervous system and leads to the release of neurotransmitters (such as dopamine). Like other addictive substances, nicotine is thought to have an effect by activating the mesocorticolimbic dopamine system.^[2] Cigarette addiction is a complex behavior in which environmental and genetic factors play a role and is used by many people of all ages and occupations. It adversely affects smokers physically, spiritually, socially and economically.

There are several scales developed to assess nicotine dependence, especially its severity. The Fagerström Test for Nicotine dependence (FTND) is the most commonly used scale. In recent years, Heaviness of smoking index (HSI), which consists of two questions of FTND, has been emphasized. These two questions are the first cigarette of the day and the total number of cigarettes consumed during the day. In studies using HSI, it has been reported to be as good as FTND, and there is a good correlation between biochemical markers of nicotine intake.^[3]

Although there are not exact statistical data on smoking specifically for pilots and other flight personnel, a significant number of pilots, cabin crew and technical personnel are considered to be smokers. Airline policies and legal regulations have been adopted in the world after 1976 to prohibit smoking during flight for cabin and cockpit crew and passengers.^[4]

Smoker flight personnel, particularly smoker pilots, must avoid nicotine intake during the flight and may show some

symptoms that result in a decrease in performance during this time.

Studies on the smoking habits of cabin crew (airplane personnel who take care of passengers on airplanes), pilot (a person who personally or professionally uses an aircraft and takes over) and other flight personnel (Dispatcher makes all flight planning necessary for the safe execution of the flights and monitors the flight throughout the flight. Technician is a team member required for the use of special flight equipment designated for aircraft or ground missions to assist the pilot. Load master is responsible for loading and unloading) are very limited.

In this study, we aimed to evaluate the smoking-related habits of flight personnel working in different airlines, smoking and quitting, especially on long flights. We aimed to evaluate the most common symptoms of nicotine deficiency during the flight and how they tried to cope with this situation.

Methods

In our study, a survey was conducted between May 2019 and July 2019 for the pilot, cabin crew and other flight crew flying in and out of Turkey in different airlines. Ethical approval was obtained from the local ethics committee (2019/1082). As a criterion for smoking, at least one smoking per day was accepted; the criterion of quitting was accepted as no smoking for a year. Flying personnel who had never smoked before and those who stopped smoking before starting their profession were not included in this study. The questions at the beginning of the questionnaire were aimed to understand age,

gender, occupation, occupational time, smoking duration and amount. The next questions were aimed whether they felt nicotine deficiency during the flight, if they did, what symptoms they showed due to nicotine deficiency, how they tried to cope with it, whether they wanted to quit smoking, or if they wanted to quit, and why did they get the most help in the process of taking and quitting? Three questions were open-ended, with the option “other” added to the answers.

We used the Cigarette Weight Index (SAI), which consisted of two questions of the Fagerström Nicotine Dependence Test (FNBT) in our study, which were the first cigarette of the day and the total number of cigarettes consumed during the day.

The survey was conducted on voluntary basis in the form of mail and printed documents at Istanbul Airport, Sabiha Gökçen Airport and İzmir Adnan Menderes Airport in Turkey.

Statistical Analysis

NCSS (Number Cruncher Statistical System) 2007 (Kaysville, Utah, USA) was used for statistical analysis. Descriptive statistical methods (frequency, percentage) were used to evaluate the study data. Pearson chi-square test and Fisher-Freeman-Halton exact test were used to compare the qualitative data. Statistical significance was accepted as $p < 0.05$.

Results

This study was conducted between May and July 2019 in a total of 263 participants, 39.9% (n=105) of women and 60.1% (n=158) of men. The ages of the participants were divided into four groups: 40.7% between the ages of 25-34 (n=107), 43% between the ages of 35-44 (n=113), 14.1% between the ages of 45-54 (n=37), 2% between the ages of 55-64 (n=6) years (Table 1).

All participants were flight personnel, including 42.2% (n=111) were cabin crew, 29.3% (n=77) were pilots, 28.5% (n=75) were dispatchers, technicians and loadmaster (Table 1).

When the occupation period of the employees was examined, the rate of the employees between 0-9 years was 48.3% (n=127), the rate of the employees between 10-19 years was 35.4% (n=93), the rate of employees between 20-29 years was 11.8% (n=31) and the rate of employees between 30 and 39 years was 4.6% (n=12) (Table 1).

Among the participants, 66.2% (n=174) were smokers. The remaining 33.8% (n=89) quit smoking. When the number of daily cigarette consumption was examined, the rate of con-

Table 1. Demographic information (general characteristics distribution)

	n	%
Age (years)		
25-34	107	40.7
35-44	113	43.0
45-54	37	14.1
55-64	6	2.3
Gender		
Female	105	39.9
Male	158	60.1
Occupation		
Cabin crew	111	42.2
Pilot	77	29.3
Other (Technician etc.)	75	28.5
Professional Time		
0-9 years	127	48.3
10-19 years	93	35.4
20-29 years	31	11.8
30-39 years	12	4.6
Cigarettes		
Smoking	174	66.2
Quit Smoking	89	33.8
Smokers Attempt to Quit Smoking		
Yes	114	65.5
No	60	34.5
Smoking Cessation Methods		
Medicine	13	14.6
Behavior Therapy	30	33.7
Bioresonance, Acupuncture etc	13	14.6
Other	33	37.1
Number of Daily Cigarette Consumption		
1-10 pieces	137	52.1
10-20 pieces	102	38.8
20-30 pieces	12	4.6
30 pieces or more	12	4.6
Pre-occupation Smoking Status		
Yes	217	82.5
No	46	17.5

suming 1-10 cigarettes was 52.1% (n=137), the proportion of consuming 10-20 cigarettes was 38.8% (n=102), and the proportion of consuming 20-30 cigarettes was 4.6% (n=12) and the ratio of 30-39 consumers was 4.6% (n=12). Among smokers, 65.5% (n=114) stated that they tried to quit smoking. The smokers reported that 14.6% (n=13) of them stopped using drugs to quit smoking, 33.7% (n=30) received behavioral therapy, 14.6% (n=13) tried some alternative methods, such as bioresonance and acupuncture and 37.1% (n=33) stated

that they tried other cessation methods (willful, convincing myself, voluntarily, pregnancy) (Table 1).

While 82.5% (n=217) of the participants smoked before starting the profession, 17.5% (n=46) started smoking after they started the profession (Table 1).

Among participants, 18.3% (n=48) felt nicotine deficiency during the flight, and 9.9% (n=26) often felt nicotine deficiency and 47.5% (n=125) sometimes felt it; while 24.3% (n=76) did not feel nicotine deficiency during the flight. The participants defined that 15.6% (n=41) of them within 1 hour, 34.6% (n=91) within 2-3 hours, 20.9% (n=55) within 3-4 hours, 28.9% (n=76) felt desire to smoke again after four hours of smoking. The most common factor aggregating the sense of nicotine deficiency during the flight rituals, such as tea and coffee with a rate of 36.9% (n=97). This was followed by long flight times with a rate of 34.6% (n=91). The remaining 17.6% (n=47) perceived job stress and 10.6% (n=28) considered prohibition of smoking as the most effective factor in feeling nicotine deficiency during flight (Table 2).

The behavioral consequences of nicotine deficiency are as follows: 51.3% (n=135) of them desire to eat, 26.2% (n=69) of them felt restlessness, 18.6% (n=49) of them was lack of concentration and 3.8% (n=10) of them felt irritability (Table 2).

While 20.5% (n=54) of the participants stated that nicotine deficiency had an effect on work performance, 41.4% (n=109) stated that it sometimes affected and 38% (n=100) stated that nicotine deficiency did not have any effects on work performance (Table 2).

Among the participants, 52.1% (n=137) coped with nicotine deficiency by eating-drinking and snacking, the remaining 35% (n=92) suppressed and 9.1% (n=24) were wearing nicotine patches. Remaining 3.8% (n=10) deals with other methods (I cannot think of it because it is forbidden, think other things, do not feel the lack of because of work) (Table 2).

Among study participants, 74.9% (n=197) tried to quit smoking, while 25.1% (n=66) never tried to quit. Among the reasons for smoking cessation, health was the leading cause with 46.4% (n=122). The remaining 27.8% (n=73) were due to family and environment, 24.7% (n=64) wanted to quit smoking and 1.5% (n=4) wanted to quit smoking for improving their professional performance (Table 3).

Among the participants, 42.2% (n=111) tried to quit smoking with behavior therapy. The remaining 29.7% (n=78) tried to quit with other methods, 19% (n=50) with medications and

Table 2. Effects of smoking during flight

	n	%
Nicotine Deficiency in Flights		
Yes	48	18.3
Often	26	9.9
Sometimes	125	47.5
No	64	24.3
Smoking Desire after Last Cigarette Consumption		
0-1 hour	41	15.6
2-3 hours	91	34.6
3-4 hours	55	20.9
4 hours or more	76	28.9
Factors Affecting Nicotine Deficiency during Flight		
Long Flight Time	91	34.6
Work Stress	47	17.9
Smoking Ban	28	10.6
Tea, Coffee, etc. Rituals	97	36.9
Behavioral Consequences of Nicotine Deficiency		
Irritability	10	3.8
Unrest	69	26.2
Lack of Concentration	49	18.6
The Desire to Eat	135	51.3
The Effect of Nicotine Deficiency on Work Performance		
Yes	54	20.5
Sometimes	109	41.4
No	100	38.0
Coping with Nicotine Deficiency during Flight		
Nicotine Patch	10	3.8
Suppression	92	35.0
Eating and Drinking	137	52.1
Other	24	9.1

9.1% (n=24) with some alternative methods, such as bioresonance and acupuncture (Table 3).

The rate of smokers within the first five minutes after waking was 2.3% (n=6). The rate of smokers between six minutes and 30 minutes was 14.8% (n=39) and the rate of smokers after 30 minutes was 28.9% (n=218) (Table 3).

According to the results of the HSI dependency test applied to the participants, the rate of the participants with low addiction level was 89.7% (n=236), while the proportion of the participants with moderate addiction level was 10.3% (n=27) (Table 3).

Table 3. Distribution of smoking cessation

	n	%
Attempt to Quit		
Smoking		
Yes	197	74.9
No	66	25.1
Reason for Quitting Smoking		
Professional Performance	4	1.5
Family, Environment	73	27.8
Health	122	46.4
Getting Rid of Addiction	64	24.3
Smoking Cessation Method		
Medicine	50	19.0
Behavior Therapy	111	42.2
Bioresonance Acupuncture	24	9.1
Other	78	29.7
First Cigarette Consumption after		
Waking up		
In the first five minutes	6	2.3
6-30 minutes	39	14.8
30 min later	218	82.9
Heaviness of Smoking Index		
Test Dependency Results		
Low Addiction	236	89.7
Moderate Addiction	27	10.3

There was a statistically significant difference between genders regarding the smoking status ($p=0.005$; $p<0.01$). The rate of smoking cessation was significantly higher in male subjects (Table 4).

No statistically significant difference was found between the different professions regarding the smoking status ($p>0.05$) (Table 4).

There was a statistically significant difference regarding the distribution of smoking status among the cases according to the duration of the patients in the profession ($p=0.002$; $p<0.01$). The rate of cases who smoked in the occupation was significantly higher than that of smokers who quit smoking (Table 4).

No statistically significant difference was found between the cases grouped according to the cigarette consumption amounts regarding the smoking status ($p>0.05$) (Table 4).

A statistically significant difference was found between the cases when grouped for the time passed from waking up to the smoking, regarding the smoking status ($p=0.011$; $p<0.05$). The rate of the first cigarette smoking between 6-30

Table 4. Assessments regarding smoking status

	Smoking Status	
	Smoker n (%)	Quit Smoke n (%)
Gender		
Female	80 (46.0)	25 (28.1)
Male	94 (54.0)	64 (71.9)
Profession		
Cabin Crew	78 (44.8)	33 (37.1)
Pilot	48 (27.6)	29 (32.6)
Other (Dispatcher, Technician etc.)	48 (27.6)	27 (30.3)
Professional Experience		
0-9 Years	88 (50.6)	39 (43.8)
10-19 years	68 (39.1)	25 (28.1)
20-29 years	12 (6.9)	19 (21.3)
30-39 years	6 (3.4)	6 (6.7)
Amount of Smoking		
1-10 pieces	89 (51.1)	48 (53.9)
10-20 pieces	73 (42.0)	29 (32.6)
20-30 pieces	6 (3.4)	6 (6.7)
>30 pieces	6 (3.4)	6 (6.7)
First Cigarette Consumption after Waking up		
0-5 Minutes	6 (3.4)	0 (0.0)
6-30 minutes	19 (10.9)	20 (22.5)
>30 minutes	149 (85.6)	69 (77.5)

^aPearson Chi-Square Test; ^bFisher Freeman Halton Test * $p<0.05$ *** $p<0.01$.

minutes after waking was significantly higher in quitted patients than smokers (Table 4).

The rate of moderate dependence of the heaviness of smoking index (HSI) level of the participants in the quitted group was found to be significantly higher than that of the current smokers ($p=0.001$; $p<0.01$) (Table 5).

There was a statistically significant difference between the distribution of causes of the sensation of nicotine deficiency in flight according to smoking status ($p=0.001$; $p<0.01$). It was observed that the long flight periods were the reason for nicotine deficiency in the smoker group, whereas the idea that smoking was prohibited was significantly higher in the quitted group (Table 5).

A statistically significant difference was found between the distribution of coping with nicotine deficiency in flight according to smoking status ($p=0.004$; $p<0.01$). The rate of coping with nicotine deficiency with other methods (I

cannot think of it because it was forbidden, thinking other things, working, and not feeling its deficiency) in the currently smoking group was found to be significantly higher than that of quitted smokers (Table 5).

There was a statistically significant difference between the distribution of the duration of the cases from the last cigarette to the desire to smoke according to the state of nicotine deficiency in the flights ($p=0.001$; $p<0.01$). The rate of the desire to smoke in the 0-1 hour and the rate of 2-3 hours after the last cigarette was found to be significantly higher in the patients who often experienced nicotine deficiency in flights (Table 6).

There was a statistically significant difference regarding the coping method of patients with nicotine deficiency between

Table 5. Assessments regarding smoking status

	Smoking Status	
	Smoker n (%)	Quit Smoking n (%)
Heaviness of Smoking Index (HSI)		
Low Addiction	167 (96.0)	69 (77.5)
Moderate Addiction	7 (4.0)	20 (22.5)
Reasons for Feeling Nicotine Deficiency in Flights		
Long Flight Time	70 (40.2)	21 (23.6)
Work Stress	31 (17.8)	16 (18.0)
Smoking Ban	9 (5.2)	19 (21.3)
Tea, Coffee, etc. Rituals	64 (36.8)	33 (37.1)
Coping with Nicotine Deficiency in Flights		
Nicotine Patch	6 (3.4)	4 (4.5)
Suppression	58 (33.3)	34 (38.2)
Eating and Drinking	86 (49.4)	51 (57.3)
Other	24 (13.8)	0 (0.0)

^aPearson Chi-Square Test; ^bFisher Freeman Halton Test; * $p<0.05$ ** $p<0.01$.

Table 6. Assessments regarding nicotine deficiency

	Feeling of Nicotine Deficiency in Flights			
	Yes n (%)	Often n (%)	Sometimes n (%)	No n (%)
Smoking Request Time after Last Smoking				
0-1 Hour	13 (27.1)	10 (38.5)	12 (9.6)	6 (9.4)
2-3 Hours	29 (60.4)	15 (57.7)	41 (32.8)	6 (9.4)
3-4 Hours	6 (12.5)	1 (3.8)	48 (38.4)	0 (0.0)
>4Hours	0 (0.0)	0 (0.0)	24 (19.2)	52 (81.3)

^aPearson Chi-Square Test ** $p<0.01$.

patients having different thoughts about the effects of nicotine deficiency on work performance ($p=0.001$; $p<0.01$). The proportion of patients who think that nicotine deficiency sometimes affects work performance in flights is significantly higher than those who think that it does not affect work performance (Table 7).

There was a statistically significant difference between the distribution of HSI test results of the cases according to age groups ($p=0.001$; $p<0.01$). The rate of moderate dependence on HSI outcome in cases aged 45-54 years was significantly higher.

A statistically significant difference was found between the distribution of HSI test results of the patients according to the status of nicotine deficiency in flight ($p=0.010$; $p<0.05$). In patients who did not experience nicotine deficiency in flight, the rate of moderate dependence of HSI was found to be significantly higher (Table 8).

Table 7. Assessments regarding nicotine deficiency

	The Thought that Nicotine Deficiency in Flight Affects Work Performance		
	Yes n (%)	Sometimes n (%)	No n (%)
Coping with Nicotine Deficiency in Flight			
Nicotine Patch	1 (1.9)	9 (8.3)	0 (0.0)
Suppression	26 (48.1)	32 (29.4)	34 (34.0)
Eating and Drinking	27 (50.0)	68 (62.4)	42 (42.0)
Other	0 (0.0)	0 (0.0)	24 (24.0)

Fisher Freeman Halton Test ** $p<0.01$.

Table 8. Evaluations of heaviness of smoking index (HSI) Test

	Heaviness of Smoking Index	
	Low Addiction n (%)	Moderate Addiction n (%)
Age		
25-34 years	107 (100.0)	0 (0.0)
35-44 years	105 (92.9)	8 (7.1)
45-54 years	18 (48.6)	19 (51.4)
55-64 years	6 (100.0)	0 (0.0)
Nicotine Deficiency in Flight		
Yes	47 (97.9)	1 (2.1)
Often	25 (96.2)	1 (3.8)
Sometimes	113 (90.4)	12 (9.6)
No	51 (79.7)	13 (20.3)

^bFisher Freeman Halton Test * $p<0.05$ ** $p<0.01$.

Discussion

Smoking is forbidden during flight. In this study, we aimed to evaluate the smoking-related habits of the flight personnel who smoked and quit, especially during long flights, and what symptoms they experienced most frequently due to nicotine deficiency during the flight and how they coped with it.

The rate of the desire to smoke in the 0-1 hour and the rate of 2-3 hours after the last cigarette was found to be significantly higher in the patients who often experienced nicotine deficiency in flights than the patients who sometimes felt or did not feel nicotine deficiency. The half-life of nicotine was about two hours. Symptoms of abstinence may develop within two hours of the last cigarette smoking, and as nicotine dependence increases, the duration of symptoms associated with nicotine deficiency decreases.^[5] When asked if they felt nicotine deficiency during the flight, almost half of the respondents answered that they sometimes felt, and about a quarter of them did not, and only 18.3% responded as 'yes' and 9.9% responded with the answer 'often' to nicotine deficiency. Parallel results were obtained in flight personnel who participated in our survey; those who felt nicotine deficiency in a shorter period after the last cigarette responded that they felt nicotine deficiency during flight.

While 20.5% of the participants stated that nicotine deficiency affects work performance, 41.4% of them stated that it sometimes affects. 38% stated that nicotine deficiency did not affect work performance. Research conducted with relatively simple driving simulators in pilots concluded that driving performance deteriorates when smokers are not allowed to smoke, and this may be the result of avoiding smoking.^[6] However, nicotine withdrawal effects have not been studied in the cockpit, in the real workplace. Most of the studies investigating the effects of nicotine withdrawal in flight personnel have been conducted with pilots. In pilots, especially during landing, difficulty in concentration due to possible nicotine deficiency may be vital. On the other hand, aviation-related studies are limited and it is difficult to make comparisons because the results obtained from previous studies on occupations not directly related to aviation and the fulfillment of tasks related to these occupations cannot directly express aviation performance. According to the opinion that nicotine deficiency affects flights' performance in flights; there was a statistically significant difference between the distributions of methods of coping with nicotine deficiency. The percentage of patients who think that nicotine deficiency sometimes affects their work performance is

significantly higher than those who think that this condition does not affect their work performance. Interestingly, the participants who think that the lack of nicotine does not affect their work performance when asked how they deal with nicotine deficiency in flight; 42% of them answered as eating and drinking, 34% of them trying to suppress, 20% of them responded as other (don't think of it because it was forbidden, thinking other things, working). A small proportion of 4% answered that I do not need it (I do not feel the need). This contrasts with those respondents who do not feel nicotine deficiency, which may be due to lack of awareness of nicotine deficiency or psychological and social reasons.

The highest effect on sensing nicotine deficiency during the flight was found in 36.9% of the patients as rituals that reminding cigarettes, such as tea and coffee. This is followed by a long flight time with a rate of 34.6%. Then job stress and smoking are regarded as the main factors. Smoking; behavioral habits, physical and psychological dependence also play a role. In laboratory studies, it is seen that smokers exposed to cigarette-related clues develop different brain activation patterns and feel more longing.^[7] Craving induced by the desire to remind of smoking also plays an important role in smoking and possibly other addictions. This can be called episodic longing or sign-longing. Treatments are both important and necessary to reduce the effect of craving triggered by sign-induced desire.^[8] Episodic craving occurs and is triggered by specific situational stimuli that accompany smoking, such as coexistence with smokers or smoking, alcohol or coffee consumption, or emotional distress.^[9] In our survey, the most common rituals, such as tea and coffee, were used to feel nicotine deficiency during the flight, which suggests that the relationship between situational stimuli and longing is mediated by conditioning or learned unification. The works on nicotine withdrawal and longing seem to continue to be an important part of clinical researches on nicotine addiction and smoking cessation.

More than half of the participants cope with nicotine deficiency by eating-drinking and snacking, about one-third by suppressing, and a smaller group by putting on nicotine patches, or using other methods (which we can't think of because it is forbidden, thinking about other things, working). On the other hand, an important issue to be considered; smoking behavior is not only the addictive effect of nicotine. The hand habit, which is associated with many senses and subconscious processes, especially the sense of touch, stimulated by smoking, has a very important place in tobacco

addiction and makes the smoking urge constantly fresh for some smokers during the quitting process. In our survey, more than half of the participants tried to cope with nicotine deficiency by eating-drinking, and snacking, revealing the importance and frequency of hand-to-mouth habits in our participants. Studies have shown that the nicotine patch prevents certain effects of nicotine withdrawal in pilots and improves performance on specific tasks during withdrawal.^[10, 11] However, 9.1% of the participants who answered our questionnaire coped with nicotine deficiency by wearing a nicotine patch. It has been shown in studies that acute nicotine drugs (eg nicotine patch and gum, etc.) can help the smokers to cope with sign-induced craving.^[12]

When the behavioral consequences of nicotine deficiency were evaluated, about half of them were eager to eat and one quarter felt uncomfortable. Then the lack of concentration meant respectively being frustrated. The most common symptoms reported during nicotine withdrawal were; nervousness, intense smoking desire, tension-anxiety, fatigue, difficulty in concentration, decreased alertness, prolonged reaction times, drowsiness, increased appetite and cognitive dysfunction.^[13]

While 74.9% of all participants (smokers and smokers) tried to quit smoking, 25.1% never tried to quit. It was found that the desire to quit smoking and the trial rate were still lower among smokers. Two-thirds of those who attempt to quit may have unsuccessful attempts to quit, and cessation or absence symptoms may be observed when smoking is stopped.^[14, 15] Most of the people who succeed in quitting smoking are reported to be successful after quitting efforts that can vary between 3 and 10.^[14, 15] Each relapse may make the cases more experienced for the next cessation attempt and not to make the same mistakes.^[15] One-third stated that they received behavioral therapy and that they used other quitting methods (will, self-convincing, voluntarily, pregnancy) at approximately the same percentage, others stated that they had the same rate of bioresonance, acupuncture, etc., and used drugs. The high proportion of those who quit smoking with self-determination, self-will and self-interest is remarkable. Therefore, it supports the success of those who have high ability to cope with withdrawal complaints during the smoking cessation process.^[16]

Among the reasons for smoking cessation, health has the highest rate with 46.4%. The answer was given in order to get rid of addiction due to family-environment and 1.5% of them want to quit smoking for professional performance.

Health is the most important motivational factor among young people considering smoking cessation because of their negative effects on long term health. In similar studies, motivation does not change with age and gender.^[17] Similar results were obtained in our study.

The majority of the participants tried to quit smoking with behavior therapy. Considering that the desire to smoke often develops along with sign-induced craving; it is suggested that avoiding or coping with the conditions that trigger smoking may be central to the success of smoking cessation. It supports the idea that making 'problem solving' the main focus of behavioral treatment are related to success.^[18] On the other hand, treatments, such as nicotine patch-gum, varenicline and bupropion, effectively reduce the background smoking impulse.

According to the results of the heaviness of the smoking Index (HSI) dependency test applied to the participants, the rate of those with a low dependence level was 89.7%, while the rate of those with moderate dependence level was 10.3%. According to the results of the survey, there were no severely dependent participants. Considering the working conditions in the aviation sector, it may not be very possible for the heavy dependent people to maintain these habits and they may choose not to enter the job or they may have changed their addiction habits after entering the job. In patients who did not have nicotine deficiency in flight, the rate of moderate dependence of HSI was found to be significantly higher. This may be related to conditioning.

When smoking and quitting participants were compared, there was a statistically significant difference between the distributions of cigarette smoking by gender. The rate of smoking cessation was significantly higher in male patients. Smoking cessation rates are lower in women than in men, and resumption rates are higher. In many studies, sociodemographic characteristics, such as male gender, advanced age, good education and socioeconomic status, having a job and not being alone (being married or living with a spouse), have been shown to have a positive effect on smoking cessation success.^[14, 19]

The rate of the first cigarette smoking between 6-30 minutes after waking was found to be significantly higher in the smokers who quit smoking, indicating that smoking dependence was higher. The HSI level of the smokers in the quitting group was found to be moderately addictive and the rate was significantly higher than that of the current smok-

ers. It has long been recognized that the “nicotine addiction level’ is the determinant of a successful attempt. However, in a recent study, among the dependency criteria, it is reported that the timing of the first cigarette smoking in the morning is quite decisive.^[20] In other words, the success of smoking cessation of smokers who smoke the first cigarette later is higher than that of early smokers. However, at this point, different results were reported. There are also studies showing that light smokers quit with more difficult.^[21] Because according to this theory, as the amount of cigarettes smoked daily increases, smokers who experience negative changes due to smoking feel more need to quit. However, it has been shown that light smokers often feel that they are not harming themselves and are pleased to reduce them from time to time instead of quitting. As a result, the increase in addiction can be encouraging for the desire to quit smoking.

The rate of current smoker cases whose occupation period was between 20-29 years was significantly higher than those who quit smoking. In addition, moderate dependence of HSI outcome was found to be significantly higher in this age group (45-54). The development and spread of smoking bans and smoking cessation outpatient clinics over time, new drugs and behavioral therapies may be more encouraging for smoking cessation for younger participants who are more open to innovations. At the same time, smoking cessation may become difficult as you get older. In addition, smoking started at an early age and therefore lasted longer and more smokers have less success than others.^[22]

There was a statistically significant difference between the distributions of causes of sensation of nicotine deficiency in flight according to smoking. While the reason for feeling nicotine deficiency was long flight time in the smoker group, it was found that prohibited smoking was the main reason for smokers who quit. At present, every long flight in smokers will continue to remind the nicotine deficiency. Prohibitions, on the other hand, can be a mandatory reason for abandoning addiction.

As a result, cigarette addiction is an important problem in flight personnel and can force employees psychologically and diminish their productivity. Some pharmacological and psychological differences, which can be explained partly by genetic polymorphism, may also make smoking cessation difficult. The research we conducted in this special group aimed to examine the methods of coping with tobacco addiction, and there is a need for further researches to develop successful tobacco control and quitting methods for similar specific groups.

Disclosures

Ethics Committee Approval: The Ethics Committee of Bezmialem Vakıf University Non-Interventional Research Ethics Committee provided the approval for this study (2019/1082).

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