





Research Article

Ankara Med J, 2023;(4):441-454 // doi 10.5505/amj.2023.39225

ASSESSMENT OF PHYSIOLOGICAL AND PSYCHOLOGICAL DEPENDENCE ON TOBACCO

 **Mert Bardakcı**¹,  **Serdar Öztora**²

¹Department of Family Medicine, Çine State Hospital, Aydın, Turkey

²Department of Family Medicine, Faculty of Medicine, Trakya University, Edirne, Turkey

Correspondence:

Mert Bardakcı (e-mail: drmertbardakci@gmail.com)

Submitted: 05.10.2023 // Accepted: 26.12.2023



Abstract

Objectives: Smoking is recognized as the most important preventable public health problem in the world with known carcinogenic, mutagenic and addictive effects on many organs and systems.

Materials and Methods: Our study was conducted with 380 first-year students of Trakya University who were tobacco users in the 2020-2021 academic year. The 62-question questionnaire included questions about socio-demographic characteristics and smoking, as well as the 6-question Fagerstrom Nicotine Dependence Test (FTND) and the 25-question Test to Assess the Psychological Dependence on Smoking (TAPDS).

Results: Our study consisted of 185 male (48.69%) and 195 female (51.31%) students. Of the participants, 94 (24.73%) were from health-related faculties and 286 (75.27%) were from non-health-related faculties. It was observed that 364 (95.78%) of the participants smoked cigarettes and 16 (4.22%) used non-cigarette tobacco products. When the participants were classified according to their FTND scores, the most crowded category was very "slightly addicted" with 210 participants (55.27%), while the most crowded category was "moderately addicted" with 190 participants (50%) according to their TAPDS scores. It was also observed that using cigarettes as a tobacco product, having a smoker in the family and living alone at home made a statistically significant difference for both physical and psychological addiction. In our study, it was determined that there was a statistically significant, linear, same-directional and moderate relationship between physical dependence and psychological dependence.

Conclusion: In order to better understand the factors affecting smoking addiction and to make individualized treatment selection, it is important to differentiate between physical and psychological addiction.

Keywords: Cigarette, tobacco, physiological, psychological, dependence, family medicine.

Introduction

Tobacco use is recognized as the most important preventable public health problem in the world. It is known to cause more than 8 million deaths each year, 7 million of which are directly caused by tobacco use and 1.2 million of which are non-smokers exposed to second-hand smoke, and it is estimated that if this continues, smoking-related deaths will reach 10 million by 2030.¹ It is known that approximately 4000 chemicals such as carbon monoxide, cyanide, tar, nicotine, ammonia, carcinogenic and mutagenic substances in cigarettes are harmful to various organs and systems of the human body with synergistic effect and they cause serious diseases.² Nicotine, which enters the body when smoking, acts on the central nervous system and affects the release levels of neurotransmitters such as dopamine, acetylcholine, serotonin and noradrenaline. By affecting nicotinic acetylcholine receptors, dopamine increases, and the "nucleus accumbens", the pleasure and reward center in the brain, is affected. At the same time, the release of noradrenaline from the locus coeruleus causes seeking behavior and restlessness. This neurotransmitter system interacts with each other and with many complex systems, such as glutamatergic systems, and plays a role in the development of addiction.^{3,4} As the act of smoking continues, the number of nicotinic receptors in the body increases, resulting in the fact that the same amount of cigarettes consumed becomes not enough to saturate the receptors (tolerance). The compulsive use of cigarettes and the emergence of conditions such as irritability, craving and seeking behavior (withdrawal) when cigarettes cannot be accessed are defined as "Physical Dependence".^{5,6}

"Psychological addiction" has been recognized as important as physical addiction in recent years and has become an important issue in preventing smoking addiction and determining treatment preferences. Apart from the active and addictive psychostimulant substances in cigarettes, smoking behavior can cause people to keep smoking by citing such factors as a pretext as social acceptance, accompaniment of activity, relaxation, stress control, self-reward, self-expression and image. These factors provide psychological support for smoking addiction or help to develop psychological addiction.⁷⁻¹⁰ This shows that smoking addiction is an addiction that needs to be examined multidimensionally. Many scales have been developed and used to help diagnose and treat the types and parameters of smoking/tobacco addiction.^{9, 11, 12} In our study, we aimed to examine the physical and psychological dependence of smokers on cigarettes, the factors affecting them and the relationships between them in order to better understand their reasons why they smoke, and to eventually guide them in determining the appropriate steps to quit smoking.

Materials and Methods

Our study is a cross-sectional and descriptive study conducted among Trakya University first-year students in the 2020-2021 academic year. The study, which was conducted during the COVID-19 pandemic period, reached all first-year students studying at Trakya University (a total of 11,005 people), and all of them were invited to

the study. The data forms of 380 first-year students who volunteered to participate in the study and who were smoking/tobacco users were included in the sample.

The data were collected with a questionnaire consisting of 62 questions. The questionnaire included 31 questions about sociodemographic characteristics, smoking, smoking cessation status and factors that may affect smoking, as well as the Fagerstrom Test for Nicotine Dependence (FTND) consisting of 6 questions and the Test to Assess the Psychological Dependence on Smoking (TAPDS) consisting of 25 questions. The FTND is a scale that measures the severity of physical dependence on nicotine, which was created by revising the "Fagerstrom Tolerance Test" created by Karl-Olov Fagerström in 1978, and the reliability study of the Turkish version was conducted by Uysal et al.^{3,13} The results are analyzed in five groups as very low dependence, low dependence, moderate dependence, high dependence and very high dependence. The TAPDS was developed by Ponciano-Rodriguez et al. in 2015 to assess the psychological dependence on smoking, and the Turkish validity and reliability study was conducted by Bardakçı et al. in 2021.^{8,9}

Statistical Analysis

Median, minimum, and maximum values were given for descriptive statistics, and categorical variables were calculated as numbers and percentages. Mann Whitney U test was used for two independent group comparisons, and Pearson Chi-Square, Fisher's Exact and Fisher Freeman Halton tests were used for comparisons of differences between categorical variables according to groups. Kruskal Wallis H test was used for comparisons of more than two independent groups. Spearman rho correlation coefficient (r-value) was used to analyze the relationship between variables. Statistical analyses were performed with the Jamovi project (2021), Jamovi (Version 2.0.0.0), and JASP (Version 0.14.1.0) programs. A p-value lower than 0.05 was considered statistically significant.

Results

Of the 380 participants, 185 (48.68%) were male, and 195 (51.32%) were female, with a median age of 20 years (18-52). 361 (95%) of the participants had not repeated a grade, and 286 (75.27%) were studying in faculties not related to health. The socio-demographic characteristics of the participants are summarized in Table 1.

305 (80.26%) of the participants had a family member who smoked, and the median number of tobacco users in their family was 2 (0-10). Most of the 268 (70.52%) participants' close circle of friends were regular smokers, and 245 (64.47%) of the participants stated that they were sometimes asked whether they smoked when they applied to a health institution for any reason. 349 (91.85%) thought that smoking/tobacco use was harmful to

health. 248 (65.34%) of the participants reported that they currently smoked cigarettes/tobacco every day, and 364 (95.78%) of the participants used cigarettes as a tobacco product. The median age at initiation of smoking was 16 years, and 232 (61.05%) of the participants reported smoking for less than five years. Participants had smoked for a median of 4 years.

Table 1. Socio-demographic characteristics of the participants

Category		n (%)
Age	≥ 20 years	147 (38.68)
	< 20 years	233 (61.32)
Gender	Male	185 (48.68)
	Female	195 (51.32)
Faculty/department	Faculties related to health	94 (24.73)
	Faculties not related to health	286 (75.27)
Siblings	No siblings	57 (15)
	Have siblings	323 (85)
Person living with	At home, alone	14 (3.68)
	With my family	343 (90.32)
	Other	23 (6)
Where respondents spend most of their lives	Village	43 (11.31)
	District center	146 (38.43)
	Provincial center	191 (50.26)

Among the students, 172 (45.26%) stated that they did not plan to quit smoking, 243 (63.94%) participants had tried to quit smoking before, and 105 (43.2%) stated that they were able to quit smoking for 1-14 days in their most recent quitting attempt. 227 (59.73%) of the participants stated that they had not consulted any health institution in their last attempt to quit smoking.

The most frequently cited reason (65.84%) for participants to try to quit smoking was knowing that it could cause serious health problems in the future. The most important reason given by participants who did not consult a healthcare provider to quit smoking was that they thought they could quit of their own will (47.1%) without using any method. 215 (56.6%) of the participants stated that they tried to quit smoking voluntarily without using any method. The most common method (23.04%) used by the participants to quit smoking was to try to quit all at once without gradually cutting down (Table 2).

Participants scored a median of 2 (min 0, max 10) on the FTND and a median of 47 (min 25, max 75) on the TAPDS. According to the FTND, the most common group was the very slightly dependent group, with 210 (55.27%) participants, whereas the most common group was the moderately dependent group, with 190 (50%) participants, according to TAPDS. (Table 3).

Table 2. Participants' smoking/tobacco use characteristics

Description		n (%)
Smoking use in the family	No	75 (19.74)
	Yes	305 (80.26)
The density of regular tobacco users in participants' close circle of friends	Nobody uses it	5 (1.31)
	The majority do not use it	29 (7.64)
	Majority use it	268 (70.52)
	They all use it	78 (20.53)
The frequency with which participants were questioned about their smoking/tobacco use in health institutions	Never	92 (24.22)
	Sometimes	245 (64.47)
	Always	43 (11.31)
Participants' opinions on the harm of smoking to health	Not harmful	31 (8.15)
	Harmful	349 (91.85)
Smoking status of the participants	I smoke occasionally now; I never used to smoke at all.	38 (10)
	I smoke occasionally now; I used to smoke occasionally	74 (19.5)
	I smoke occasionally now; I used to smoke every day	20 (5.26)
	I smoke every day now	248 (65.34)
Which tobacco product did the participants use	Cigarette	364 (95.78)
	Non-cigarette tobacco products	16 (4.22)
How many years the participants have been smoking	< 5 years	232 (61.05)
	5-10 years	137 (36.05)
	> 10 years	11 (2.9)
Whether participants have ever attempted to quit smoking/tobacco	No	137 (36.06)
	Yes	243 (63.94)
How long the participants did not smoke/tobacco in their last attempt to quit smoking/tobacco	1-14 days	105 (43.20)
	15-30 days	38 (15.63)
	1 month - 3 months	46 (18.93)
	3 months - 6 months	30 (12.34)
	6 months - 1 year	20 (8.24)
	More than 1 year	4 (1.66)
Whether the participants who have attempted to quit smoking/tobacco have applied to any health institution	Those who do not apply to a health institution	230 (94.65)
	Applicants to a health institution	13 (5.35)
How participants realized their attempts to quit smoking/tobacco use	Quitting suddenly	124 (51.03)
	Those who have tried and failed to quit smoking	63 (25.93)
	By reducing the number of cigarettes per day	56 (23.04)
Participants' reasons for attempting to quit smoking use	Knowing that smoking can cause serious health problems in the future	160 (65.84)
	Monetary burden/loss	135 (55.55)
	My close circle of relatives asking me to quit for my own sake	55 (22.63)
	Smoking takes up/wastes my time	50 (20.57)
	My close environment is uncomfortable with my smoking	30 (12.34)
	I have existing health problems	21 (8.64)

Table 3. Grouping of Participants According to Scale Scores

Scale Scores		n (%)
Fagerstrom Test for Nicotine Dependence (FTND)	Very low dependency	210 (55.27)
	Low dependency	76 (20)
	Moderate dependency	41 (10.78)
	High dependency	38 (10)
	Very high dependency	15 (3.95)
Test to Assess the Psychological Dependence on Smoking (TAPDS)	Mild dependence	118 (31.05)
	Moderate dependence	190 (50)
	Severe dependence	72 (18.95)

Gender and being enrolled in a health-related/non-health-related faculty did not create a significant difference according to the TAPDS, whereas males and being enrolled in a non-health-related faculty were found to be associated with significantly higher dependency scores according to the FTND.

Living alone at home, having a smoker/tobacco user in the family, having more smokers in the close circle of friends, not thinking that smoking is harmful to health, smoking more frequently, preferring cigarettes as the tobacco product used, not thinking about quitting smoking and not having tried to quit smoking were found to be associated with higher addiction scores according to both FTND and TAPDS (Table 4).

A statistically significant, linear, same-directional and moderate relationship was found between FTND scores and TAPDS categories (Figures 1 and 2).

Table 4. Evaluation of sociodemographic and smoking characteristics according to TAPDS and FTND scores

Socio-demographic and smoking characteristics	TAPDS [min-max]	p	FTND [min-max]	p
Age				
Under 20	49 [25 - 73]	0.083	1 [0 - 9]	0.153
20 and over	46 [25 - 75]		2 [0 - 10]	
Gender				
Male	47 [25 - 75]	0.931	3 [0 - 10]	0.025
Female	47 [26 - 75]		1 [0 - 10]	
Faculty / Department				
Related to health	48 [26 - 75]	0.724	1 [0 - 10]	0.047
Not related to health	47 [25 - 75]		2 [0 - 10]	
The current environment				
Home, alone	57 [32 - 68]	0.044	5 [0 - 8]	0.008
With my family	47 [25 - 75]		2 [0 - 10]	
Other	41 [26 - 75]		2 [0 - 7]	
Whether there is a smoker in their family				
No	45 [26 - 64]	0.033	1 [0 - 9]	<0.001
Yes	48 [25 - 75]		2 [0 - 10]	
Regular smokers in the close circle of friends				
Nobody uses it	36 [34 - 67]	0.002	1 [0 - 10]	<0.001
The majority don't use it	43 [29 - 60]		0 [0 - 10]	
Majority use it	47 [25 - 75]		2 [0 - 9]	
They all use it	52 [31 - 73]		4 [0 - 9]	
Thinking that smoking is harmful to health				
I don't think it's harmful	56 [33 - 75]	<0.001	4 [0 - 9]	0.003
I think it is harmful	47 [25 - 75]		2 [0 - 10]	
How they describe their smoking/tobacco use				
I smoke occasionally now; I never used to smoke at all	38 [26 - 64]	<0.001	0 [0 - 7]	<0.001
I smoke occasionally now; I used to smoke occasionally	41 [25 - 75]		0 [0 - 7]	
I smoke occasionally now; I used to smoke every day	41 [29 - 65]		0 [0 - 6]	
I smoke every day now	51 [26 - 75]		4 [0 - 10]	
Type of tobacco product used				
Cigarette	48 [26 - 75]	0.004	2 [0 - 10]	0.001
Non-cigarette tobacco products	40.5 [25 - 58]		0 [0 - 7]	
Smoking cessation attempt				
Not attempting to quit	50 [28 - 75]	0.003	3 [0 - 9]	0.011
Attempting to quit	46 [25 - 73]		2 [0 - 10]	
The status of applying to any health institution in a smoking cessation attempt				
Non-applicants	46 [25 - 73]	0.008	1 [0 - 10]	<0.001
Applicants	51 [34 - 66]		5.5 [0 - 9]	
How did they realize their smoking cessation attempts				
I tried to quit smoking/tobacco but failed	53 [29 - 73]	<0.001	3 [0 - 10]	<0.001
By reducing the number of cigarettes per day	43.5 [26 - 67]		1 [0 - 7]	
Quitting suddenly	45 [25 - 69]		1 [0 - 10]	

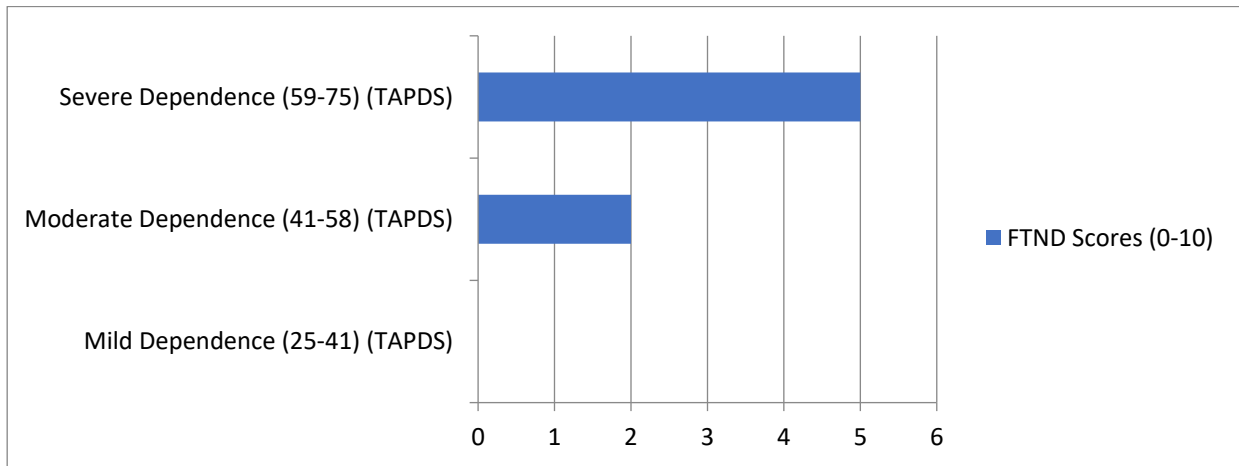


Figure 1. The relationship between participants' TAPDS and FTND scores

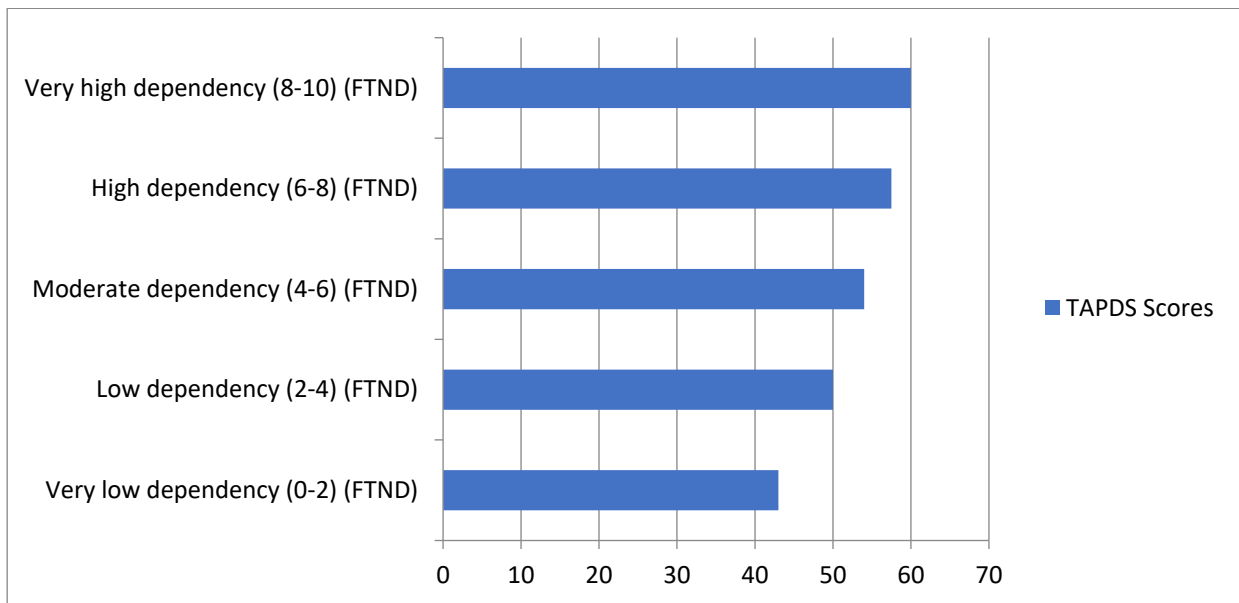


Figure 2. The relationship between participants' FTND and TAPDS scores

Discussion

Smoking/tobacco use is one of the leading preventable public health problems in our country and in the world. The struggle to protect society from smoking and its effects includes both the cessation of smoking by smokers and the protection of non-smokers from the harmful effects of smoking. Therefore, it is necessary to examine all factors that are thought to have an effect on smoking and to investigate the characteristics of psychological addiction as well as physical addiction.

In our study, significantly higher dependence was found in males compared to females according to FTND, whereas no significant difference was found according to TAPDS. In 2012, in the comprehensive Global Adult Tobacco Survey (GATS) conducted in Turkey, smoking rates were found to be 47.9% in men and 15.2% in women in the whole population.¹ Similarly, many researchers have reported that the smoking prevalence of men is significantly higher than that of women, while a study conducted on university students reported that gender did not make a significant difference in the examination of smoking addiction.¹⁴⁻¹⁷ In a study conducted in a smoking cessation center in Mexico, in line with our study, significantly higher dependence was found in men compared to women, according to FTND, while no significant difference was found according to TAPDS.⁹ In a study conducted in a smoking cessation center in Turkey, no significant difference was found between genders according to both FTND and TAPDS.¹⁰ The high prevalence of smoking and nicotine addiction in men, which is generally accepted in the literature, has been interpreted as the gender roles attributed to men in a patriarchal society and the fact that smoking is seen as a sign of power, self-confidence and independence. However, the fact that there was no significant difference, especially in terms of psychological dependence, suggests that psychological factors are less affected by gender.

In our study, both physical and psychological dependence levels were found to be significantly higher in those who had smokers in their families. In the literature, many studies conducted in medical faculties concluded that the effect of having parents and siblings who smoke significantly increased the likelihood of smoke addiction, which is consistent with our study.¹⁸⁻²⁰ People are influenced throughout their lives by the environments in which they are born and raised. Many behaviors of the people in the family who care, protect and serve as role models are taken as examples by the child. It is expected that the likelihood of this behavior will increase in members of families with smoking/tobacco use. In addition, while the prohibition and intimidation of authority figures at home can play a preventive role against harmful habits, an authority figure who is a bad example of smoking/tobacco use will have difficulty in prohibiting this behavior for other members.

It was found that as the regular smoking/tobacco use status of the friends of those students who participated in our study increased, smoking addiction increased according to both FTND and TAPDS. Friends are together in one or more activities during the day; they help each other, they talk to each other, and they can share many things. Therefore, it is inevitable that they are influenced by each other. For this reason, smoking is also an activity that is suitable for doing together and for friends to encourage each other. Many studies in the literature have emphasized that having friends who smoke is an important risk factor for smoking addiction.^{21,22}

In our study, health-related faculties had significantly lower FTND scores than non-health-related faculties. Many studies have been conducted to investigate the relationship between the smoking addiction levels of university students who smoke and the faculties in which they study. In studies conducted in Egypt, England and Turkey, students studying in medical faculties were found to have lower smoking rates than students studying in non-health-related departments.^{18,23,24} In another study conducted in Turkey, it was reported that FTND scores of medical faculty students were also lower than those of other students.²⁵ Unlike the general literature, there are also studies that conclude that smoking addiction scores do not differ significantly according to the faculties of study.²⁶ In light of these data, it can be said that the FTND results of our study are compatible with the literature. In our study, no significant difference was found in TAPDS scores in terms of psychological dependence, which has not been sufficiently examined in the literature. It should be considered that these differences may vary according to which faculties were examined and how they were grouped. In general, although it is observed that both smoking rates and nicotine addiction rates of students in departments with more knowledge about the harms of smoking are lower, it will be important to evaluate the types of smoking addiction separately in future studies.

In our sample, 95.8% were cigarette smokers, and 4.2% were users of non-cigarette tobacco products such as pipes, cigars, hookahs, and electronic cigarettes. Similarly, in many studies, it is noteworthy that cigarettes are used at the highest rate among tobacco products.^{1,27} In addition, in our study, it was observed that cigarette smokers had significantly higher dependence on FTND and TAPDS than non-cigarette smokers. The fact that cigarettes have a more standardized form and are more easily accessible than other tobacco products may have caused them to be used more than other tobacco products. The fact that cigars, pipes, electronic cigarettes and hookahs are relatively more difficult to access may leave addicted individuals in a difficult situation when they experience withdrawal; therefore, it can be expected that people who use non-cigarette tobacco products are mostly composed of people with lower addiction levels.

In our study, when the participants who wanted to quit smoking were asked why they wanted to quit smoking, health-related concerns ranked first in line with the literature.^{3,28} Moreover, in our study, it was found that people who thought of quitting smoking due to health concerns were less dependent, according to both the FTND and the TAPDS.

The FTND is the scale that is considered to best assess the building blocks of physical dependence, such as withdrawal and tolerance.⁸ In our study, FTND was used to measure physical dependence, and the most populous group was the very slightly dependent group, with 55.3%, which is consistent with the literature. In studies conducted in universities, the group with the lowest level of dependence score according to FTND constituted the largest percentage; Yengil et al. found 51.6%, Okutan et al. 40.9%, Selçuk et al. 54.4%.^{18, 29, 30}

As the pathophysiology of smoking addiction is examined, it is understood that it is a multidimensional process that is formed by the combination of many complex and mutually reinforcing factors. It is thought that it would be incomplete to consider smoking only as a physical addiction, and similarly, the psychosocial aspect should also be examined separately.^{8, 9} Karlıkaya et al. emphasized the importance of genetic factors and nicotine addiction as well as psychosocial factors in smoking behavior and its continuation.⁴ Examples include people with psychiatric illnesses starting to smoke earlier and more intensely than the general population, the tendency of individuals to see smoking as a solution when they are under distress and stress, and individuals with neglectful parents seeking to compensate for emotional deprivation in addictive substances such as cigarettes show the importance of examining the psychological dimension of smoking.¹⁰ In our study, we tried to measure the psychological dependency levels of the students with TAPDS. While those with moderate psychological dependence constituted the largest group with 50%, those with severe psychological dependence constituted the smallest group with 18.9%. When it is remembered that the most crowded group in the same sample with the FTND was the group with very low dependency at 55.3%, it can be seen that the two scales asked different questions according to different parameters as intended and as a result, they could evaluate different dependencies.

In our study, in which we compared both scales, it was found that there was a statistically significant, linear, same-directional, and moderate correlation between FTND scores and TAPDS scores. Ponciano-Rodríguez et al. found a same-directional and weak correlation, while Hezer and Karalezli found a moderate, same-directional, linear relationship.^{9, 10} These scales, which reveal two dimensions of smoking addiction, emphasize the need for a multidimensional approach to smoking addiction. Using both scales together in smoking addiction studies will provide more complementary and more accurate results.

In conclusion, since smoking addiction is a multidimensional process formed by the combination of many complex and mutually reinforcing factors, it would be insufficient to treat it only as a physical addiction. For this purpose, FTND and TAPDS are considered to be meaningful, correlated and preferable scales for the examination of physical and psychological addiction to cigarettes separately and can be easily applied in primary care.

Limitations

The fact that the study was conducted during the COVID-19 Pandemic should be taken into consideration that the study data may reveal different results compared to routine life.

Ethical Considerations: Approval was obtained from the Trakya University Faculty of Medicine Scientific Research Ethics Committee (Trakya -BAEK 2021/106).

Conflict of Interest: The authors declare no conflict of interest.

References

1. TC Sağlık Bakanlığı Küresel Yetişkin Tütün Araştırması Türkiye 2012. Sağlık Bakanlığı Yayın. 2014;948.
2. Karan LD. Pain and Addiction in Patients Who Smoke Cigarettes. The American Society of Addiction Medicine Handbook on Pain and Addiction. 2018;331.
3. Türk Toraks Derneği Sigara Bırakma Tanı ve Tedavi Uzlaşı Raporu. Ankara; 2014.
4. Karlıkaya C, Öztuna F, Solak ZA, Özkan M, Örsel O. Tütün kontrolü. Toraks dergisi. 2006;7(1):51-64.
5. Yararbaş G. Ödül sistemi bozuklukları, ilaç kötüye kullanımı ve tedavileri. İT Uzbay. Stahl'ın temel psikofarmakolojisi nörobilimsel ve pratik uygulamalar. 2012:943-1011.
6. Kauer JA, Malenka RC. Synaptic plasticity and addiction. Nature reviews neuroscience. 2007;8(11):844-58.
7. McManus S, Meltzer H, Champion J. Cigarette smoking and mental health in England: Data from the Adult Psychiatric Morbidity Survey 2007. London: National Centre for Social Research. 2010.
8. Bardakci M, Oztora S, Dagdeviren HN. The Reliability and Validity Analysis of The Turkish Version of the Test to Assess the Psychological Dependence on Smoking. Euras J Fam Med. 2021;10(2):100-6.
9. Ponciano-Rodríguez G, Valerio-Gutiérrez R, Pliego-Rosas C, Córdova-Alcaráz A. Development and evaluation of a new self-rating test to assess the psychological dependence on smoking (TAPDS). J Addict Med Ther. 2015;3(2):1016.
10. Hezer H, Karalezli A. Sigaraya psikolojik bağımlılığın sigara içme arzusu ve nikotin yoksunluk semptomlarına etkisi. Ankara Medical Journal. 2019;19(4):700-7.
11. Işıқтаş S, Karafistan M, Dilan A, Yılmaz AS. Sigara içen ve içmeyen bireylerin stresle başa çıkma tutumları açısından karşılaştırılması. Kıbrıs Türk Psikiyatri ve Psikoloji Dergisi. 2019;1(2):102-7.
12. Sağlam L. Nikotin bağımlılığının klinik değerlendirilmesi. Güncel Göğüs Hastalıkları Serisi. 2017;4(1):78-89.
13. Uysal MA, Kadakal F, Karşıdağ C, Bayram NG, Uysal O, Yılmaz V. Fagerstrom test for nicotine dependence: reliability in a Turkish sample and factor analysis. Tuberk Toraks. 2004;52(2):115-21.
14. Arslan YT, Pirinççi S, Okyay P, Döğer FK. Tobacco Use and Related Factors Among Adnan Menderes University Faculty of Medicine Freshers. Meandros Medical And Dental Journal. 2016;17(3):146-52.
15. Grassi MC, Baraldo M, Chiamulera C, Culasso F, Raupach T, Ferketich AK, et al. Knowledge about health effects of cigarette smoking and quitting among Italian university students: the importance of teaching nicotine dependence and treatment in the medical curriculum. BioMed Research International. 2014;2014.
16. Kocabas A, Burgut R, Bozdemir N, Akkoçlu A, Cildag O, Dagli E, et al. Smoking patterns at different medical schools in Turkey. Tobacco Control. 1994;3(3):228.

17. Saęar ME. Üniversite Öğrencilerinin Sigara Baęımlılıęına İlişkin Tutumlarının Sigara İçme Sıklıklarına Göre İncelenmesi. Gümüşhane Üniversitesi Sağlık Bilimleri Dergisi. 2017;6(3):41-9.
18. Yengil E. Tıp fakültesi öğrencilerinin sigara içme durumu ve sigara ile ilgili tutumları. Konuralp Medical Journal. 2014;6(3):1-7.
19. Kara S, Baş FY, Açıkalin C. Sigara içme davranışları ve etkili faktörler: Tıp ve Diş Hekimliği Fakültelerinin ilk ve son sınıf öğrencileri üzerinde çalışma. Smyrna Tıp Dergisi. 2011;1(1):16-21.
20. Singh VV, Singh Z, Banerjee A, Basannar D. Determinants of smoking habit among medical students. Medical Journal Armed Forces India. 2003;59(3):209-11.
21. Ali MM, Dwyer DS. Estimating peer effects in adolescent smoking behavior: a longitudinal analysis. Journal of Adolescent Health. 2009;45(4):402-8.
22. Schaefer DR, Haas SA, Bishop NJ. A dynamic model of US adolescents' smoking and friendship networks. American journal of public health. 2012;102(6):e12-e8
23. Anwar MM, Senosy SA. Pattern and quitting of tobacco smoking among Egyptian university students. International Journal of Adolescent Medicine and Health. 2021;33(6):523-32.
24. Havaçelięi Atlam D, Yüncü Z. Üniversitesi Öğrencilerinde Sigara, Alkol, Madde Kullanım Bozukluęu ve Ailesel Madde Kullanımı Arasındaki İlişki (Tur). Klinik Psikiyatri Dergisi. 2017;20(3):161-70.
25. Kaptanoęlu AY, Polat G, Soyer M. Marmara Üniversitesi öğrencilerinde ve öğretim üyelerinde sigara alışkanlıęı ve duraęan maliyet ilişkisi. Yükseköğretim ve Bilim Dergisi. 2012(2):119-25.
26. Yoruk C, Yararbas G. A Study on Nicotine Dependency Levels of Smoking University Students Depending On Socio-Demographic Features, and Smoking Habits. Tobacco Induced Diseases. 2018;16(3).
27. Poyrazoęlu S, Şarli Ş, Gencer Z, Günay O. Waterpipe (narghile) smoking among medical and non-medical university students in Turkey. Upsala journal of medical sciences. 2010;115(3):210-6.
28. Şahin EV, Sunay D, BALCI N, Parbucu M, ÖZPAK AM, Arslan İ. Sigara bırakma merkezlerine başvuran hastalarda nikotin baęımlılıęına yaklaşım ve etkileyen faktörler. Ortadoęu Tıp Dergisi. 2019;11(3):259-62.
29. Selçuk KT, Avcı D, Mercan Y. Üniversite öğrencilerinde sigara baęımlılıęı, sigarayı bırakmaya yönelik istek ve öz-etkililik. Clinical and Experimental Health. 2017;8:36-43.
30. Okutan O, Taş D, Kaya H, Kartaloęlu Z. Sigara içen sağlık personelinde nikotin baęımlılık düzeyini etkileyen faktörler. Tüberküloz ve Toraks Dergisi. 2007;55(4):356-63.