

Fagerstrom Test for Nicotine Dependence among a Sample of Smokers from Secondary School Students in Al-Najaf City, Iraq

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KEYWORDS

Fagerstrom test,
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ABSTRACT

Background: Tobacco addiction is a global social issue, leading to one death every six seconds worldwide. The Fagerstrom Test for Nicotine Dependence (FTND) is a commonly used tool to assessing physical nicotine dependence. The FTND scores range from 0 to 10 and consist of six questions, each with its score reflecting the smoker's level of nicotine dependence. This study aimed to assess the nicotine dependence of secondary school students using the Fagerstrom test.

Methodology: A cross-sectional study was conducted from October 1, 2023, to April 10, 2024, in AL-Najaf City. The study sample included 283 smoking students, selected from a total of 829 participants from eight secondary schools, selected by using a multistage simple random sampling technique. The study instrument was a questionnaire with two parts: the first part collected some demographic characteristics, and the second part consisted of the Fagerstrom Test for Nicotine Dependence.

Result: Out of 283 smokers, 234 were males, and 49 were females. According to Fagerstrom Test items, the results show 43.1% smoke the first cigarette 60 minutes after waking up, 68.9% do not find it difficult to refrain from smoking in any forbidden places, 58% cannot give up smoking cigarettes after eating, 61.8% for ≤ 10 smoked cigarettes per day, 62.9% for never smoke more frequently during the first hours after waking and 65.7% for not smoke when so ill.

Conclusion: - 47% of smokers were in low dependence, 22.3% for low to moderate, 29.7% for moderate and 1.1 % for high dependence, with a significant difference between the Fagerstrom test and socio-economic status.

1. Introduction

Tobacco addiction, which is a social problem, causes the death of one person every six seconds worldwide. In addition, more than 600,000 non-smokers die every year due to passive smoking (1). The Fagerstrom Test for Nicotine Dependence (FTND) is a widely used test for assessing Physical nicotine dependence (2). Karl-Olov Fagerstrom developed the Fagerstrom Tolerance Questionnaire later modified by Heatherton to the Fagerstrom test for nicotine dependence (3). It's a widely used tool for assessing the intensity of physical addiction to nicotine. It's designed to measure the degree of nicotine dependence in smokers. The test includes six questions about smoking behaviour, such as the time to first cigarette in the morning and the number of cigarettes smoked daily (4). FTND is simple to administer; It is non-invasive and easy to use. Additionally, it offers a quantitative evaluation, conceptualizes the levels of addiction through behavioral and physiological symptoms, and exhibits improved nicotine addiction measuring outcomes in genetic research (5, 6).

2. Methodology

Study design and sample selection: A descriptive cross sectional study was carried out during the period between the 1st of October 2023 to the 10th of April 2024 in AL-Najaf City. The study sample was selected by a simple multistage random sample technique; the first stage was school selection, and the second stage was students' selection.

Study instruments: The interview was based on a well-structured questionnaire form. It was pre-tested during a pilot study after being presented to a panel of experts. The questionnaire consists of two parts: the first part contains some demographic characteristics, and the second consists of six items to measure nicotine dependence according to the Fagerstrom test for nicotine dependence (3).

Statistical analysis: Data analysis was done using the available statistical package of IBM SPSS-29

(IBM Statistical Packages for Social Sciences- version 29, Chicago, IL, USA). Data were presented in simple measures of frequency and percentage; the significance of different percentages was tested by using the Chi-square test, and the statistical significance was considered whenever the P value was equal to or less than 0.05.

3. Results and discussion

Table 1: the results show 82.7% males and 17.3% females. Also, 36% were from the fourth class, 34.6% from the fifth class and 29.3% from the sixth class. 77% live in their own house. Finally, 58% of students had no years of failure.

Table 1: Demographic characteristics of the study population.

Variables		Total N=283	
		No	%
Class	Fourth	102	36
	Fifth	98	34.6
	Sixth	83	29.3
Sex	Male	234	82.7
	Female	49	17.3
House type	Owned	218	77
	Rented	35	12.4
	Others	30	10.6
Number of years of failure	No	164	58
	1	65	23
	2	36	12.7
	3 years	18	6.4

Table 2: The result in this table reflects the educational and occupational status of the parents. Concerning education, 31.3% of mothers had completed secondary school, while 79.5% were unemployed (housewives). For fathers, the highest percentage 18.4%, had read & write, and 33.2% were employed.

Table 2: Distribution of parent's level of education and job.

Variables		Mother		Father	
		No	%	No	%
Education level	Illiterate	20	7.1	20	7.1
	Read & Write	36	12.7	52	18.4
	Primary school	34	12	39	13.8
	Intermediate school	62	21.9	47	16.6
	Secondary school	88	31.1	51	18
	Institute & College	34	12	51	18
	Higher degree	9	3.2	23	8.1
Job	Not working	225	79.5	40	14.1
	Worker	2	0.7	54	19.1
	Employee	38	13.4	94	33.2
	Private work	12	4.2	62	21.9
	Dead	2	0.7	14	4.9
	Retired	4	1.4	19	6.7
Total		283	100	283	100

Figure 1: Illustrates the socio-economic status of the study sample. The highest per cent, 44.5%, were in the low socio-economic status, and the lowest per cent, 12.7%, were in the high socio-economic status.

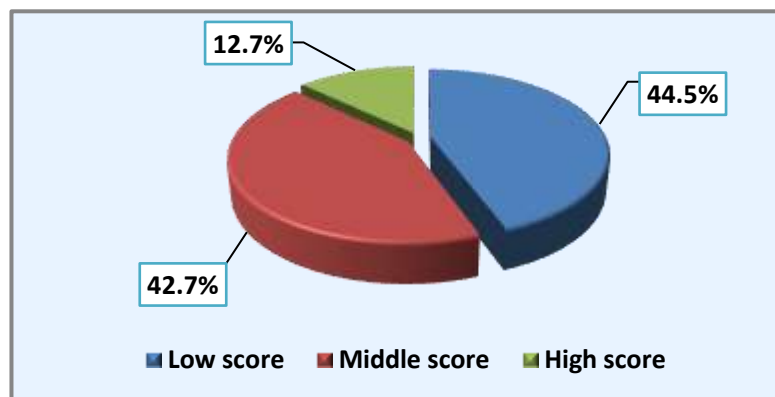


Figure 1: Distribution of study sample according to socio-economic status.

Table 3: the results show that 43.1% smoked the first cigarette 60 minutes after waking up, 68.9% do not find it difficult to refrain from smoking in any forbidden places, and 58% cannot give up smoking cigarettes after eating. 61.8% for ≤ 10 smoked cigarettes per day, 62.9% for never smoking more frequently during the first hours after waking and 65.7% for not smoking when so ill.

Table 3: Fagerstorm test for nicotine dependence for all smokers.

All smoker (n=283)		No	%
How soon after wake up smoke the first cigarette	<5	76	26.9
	5----30	42	14.8
	31---60	43	15.2
	>60minutes	122	43.1
Find it difficult to refrain from smoking in places where it is forbidden	Yes	88	31.1
	No	195	68.9
The cigarette would hate most to give up	The first one morning	38	13.4
	After eating	164	58
	Before sleep	81	28.6
The number of cigarettes per day smoked	<10	175	61.8
	11---20	76	26.9
	21---30	7	2.5
	>30cig	25	8.8
Smoke more frequently during the first hours after waking than during the rest of the day	Yes	105	37.1
	No	178	62.9
Smoke when so ill that in bed most of the day	Yes	97	34.3
	No	186	65.7

Figure 2: Reveal to Fagerstorm test for nicotine dependence score for smokers, the results show 47% of smokers were in low dependence, 22.3% for low to moderate, 29.7% for moderate and finally, 1.1 % for high dependence.

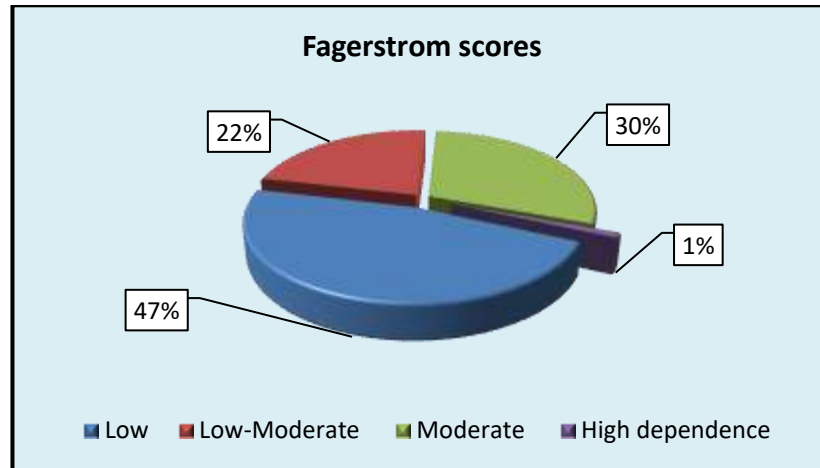


Figure (2) Fagerstorm score for nicotine dependence for all smokers.

Table 4 Shows the relation between smoking habit and some demographic characteristics; the results show no significant differences with class. However, there were highly significant differences with sex and number of years of failure.

Table 4: Relation between demographic characteristics and smoking.

Variables		Smoking				P. value
		Smoker		Not smoker		
		No	%	No	%	
Class	Fourth	89	31.1	184	64.3	0.55
	Fifth	88	28.5	211	68.3	
	Sixth	69	29.5	151	64.5	
Sex	Male	206	42.5	251	51.8	0.001*
	Female	40	11.6	295	85.8	
Number of years of failure	0	143	25.7	392	70.5	0.003*
	1	58	41.1	76	53.9	
	2	29	34.9	47	56.6	
	3	16	32.7	31	63.3	
*Significant difference between percentages using Pearson Chi-square test (χ^2 -test) at 0.05 level.						

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Table 5 shows the relationship between socioeconomic status and the Fagerstorm test for nicotine dependence score; the results show a significant difference between them.

Table 5: Relation between Socio-economic status and Fagerstorm test for nicotine dependence score.

Fagerstorm for nicotine dependence N=283	Socio-economic status			P.V
	Low score	Middle score	High score	
Low Dependence	41	58	10	0.02
Low to Mod Dependence	40	25	13	
Moderate Dependence	42	33	9	
High Dependence	3	5	4	

Discussion:

Tobacco addiction, which is a social problem, causes the death of one person every six seconds worldwide. Table 2 shows that all participants were from secondary schools, 82.7% males and 17.3% females. Of all 283 participating students, 36%, 34.6%, and 29.3% were from fourth, fifth, and sixth

classes, respectively. These results are consistent with the other study in Iraq ⁽⁷⁾, which reported that the number of males is higher than females; also compatible with other studies reported a higher proportion of males than females (8); 58% of students had no years of failure. This result agrees with a similar study in Iraq in Baghdad (7), where their results showed that 73.8% of students had no years of failure. Table 3 shows parents' education and occupation level; 31.3% of mothers had secondary school, and 79.5% were not working (Housewives). Meanwhile, the highest percentage, 18.4%, of fathers' education, had read & write education, and 33.2% were employees; this result agrees with a study done in Australia (9) and Poland ⁽¹⁰⁾. Figure 1 that reveals the socio-economic status of the study sample, the highest per cent, 44.5%, was in the low socio-economic status, the lowest per cent, 12.7%, was in the high and 42.7 in the middle socioeconomic status. These results disagree with other results in Cairo 2022 ⁽¹¹⁾; 84.7%, 14.3% and 1% were high socio-economic status, middle and low socio-economic status, respectively.

Regarding the Fagerstorm test for nicotine dependence for all smokers, as shown in Table 3, Reveals that 43.1% smoke the first cigarette 60 minutes after waking up; this question measures the urgency of the smoker's nicotine craving upon waking, with shorter times indicating higher dependence. 68.9% not find it difficult to refrain from smoking in any forbidden places "This question assesses the smoker's compulsion to smoke in situations where it is socially or legally prohibited". 58.0% cannot give up smoking cigarettes after eating; this question evaluates the smoker's attachment to certain cigarettes, indicating a psychological dependence on smoking rituals. 61.8% for ≤ 10 smoked cigarettes per day, which correlates with the level of physical addiction, and 62.9% for never smoking more frequently during the first hours after waking. This question probes into the intensity of the smoker's craving shortly after waking, reflecting a hallmark of nicotine dependence. Finally, 65.7% do not smoke when so ill; this final question assesses the compulsiveness of the smoker's habit, even in the face of illness.

As an overall assessment for the Fagerstorm test for nicotine dependence score for all smokers, the results indicate in Figure 2 that 47% of smokers were in low dependence, 22.3% for low to moderate, 29.7% for moderate, 1.1 % for high dependence, this study agrees with study in Spain ⁽¹²⁾. Additionally, the results show no significant differences between classes. However, there were highly significant differences with sex. Males are more numerous than females, which could be due to differences between the sexes in terms of freedom, girls being more restrictive, and males having more freedom and more contact with the environment outside the home. The result agrees with a study conducted in Turkey in 2019, which found that 38.3% had higher levels of smoking than females ⁽¹³⁾. There was a highly significant difference in the number of years of failure; it could be due to thinking about the family's reaction, fear and anxiety about failing again. This is compatible with a study in Turkey in 2019 that found smoking was higher in those who had retaken a failed course ⁽¹³⁾.

The study shows a significant difference in socio-economic status Table 5, which often indicates an inverse relationship between SES and nicotine dependence. This means that individuals with lower socioeconomic status are more likely to smoke and to be more dependent on nicotine compared to those with higher SES. Consequently, socioeconomic status plays a significant role in influencing smoking behavior and nicotine dependence. Lower SES is generally associated with higher rates of smoking and greater nicotine dependence, influenced by a complex interplay of economic, social, and cultural factors. Our findings are consistent with a study conducted in Baghdad (7), show a high percentage of students were in low 61.3% and a low percentage of 5.1% were in high dependence. Also, I agree with another study in Nepal ⁽¹⁴⁾.

4. Conclusion and future scope

More than half of the study sample, 58% of smokers, in a low score of nicotine dependence and lived in middle socio-economic status; 40% of them had low- moderate, 42% had moderate dependence score and the rest 5% were in a high score of nicotine addiction, with significant difference between

them ($P.V = 0.02$).

Declaration:

Declaration of conflicting interests: The Authors declare no conflict of interest.

Ethical Approval and Consent to participate: The Research Ethics Committee of the Council of the College of Health and Medical Technologies in Kufa granted all necessary clearances and ethical approvals, and the AL-Najaf Directorate of Education and all participating school administrators given the official permissions and permissions required.

Authors' contributions: **Nabaa Jasim Zghair Al-Aboudi**, contributed to completing the practical part and the introduction section and references. **Maytham Salim AL-Nasrawii** contributed by discussing the article and the abstract, analyzing the statistical data, and writing the research methods.

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