

**The relationship between the smoker age, the age of initiation of smoking and Fagerström Test for nicotine dependence among male Sudanese smokers.**

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**Abstract:**

**Objective:**The aim of this study was to determine the relationship between smoker's age,the age of initiation of smoking and Fagerström Test for nicotine dependence (FTND) among male Sudanese smokers.

**Methodology:**This is a prospective cross-sectional survey. We enrolled fifty-five adult participants in the study at smoking cessation centerof Alshaab institute of cardio-pulmonary diseases in Khartoum, Sudan in the period from August to December 2015 after taking their informed written consent.Fagerström Test for Nicotine Dependence (FTND) was recorded.

A score of (0-2) was defined as very low, (3-4) as low, (5) as moderate, (6-7) as high and score of (8-10) as very high.

The relationship between the smoker age, the age of initiation of smoking and FTND we analyzed using the International Business Machines statistical package for social science (IBM-SPSS version 22).

**Results:**All participantswere males (n=55). The mean age at initiation of regular smoking was 20 years. Around 31% of the participants started smoking before 11years, 36.4% between (11-20 years) and21.8 % between (21-30 years) whileonly 11% started smoking after 30 years. According to FTND,we found very high nicotine dependence in 30.9%, high in 23.6%, moderate in 7.3%, low in 14.5% and very lowin 23.6% of the participants.All elderly participants had high and very high nicotine dependence.

**Conclusion:**Initiating smoking at an early agewas associated with low nicotine dependence and the older participant had significantly high nicotine dependence (*P* values= 0.001 &0.002 respectively).

**Keywords;**Age, smoking, nicotine dependence and Fagerström Test.

## **Introduction:**

According to world health organization (WHO),over 1.1 billion people smoked tobacco and the prevalence was more in males than females in the year 2015. Although it is declining worldwide and in many countries, the prevalence of tobacco smoking appears to be increasing in the (WHO) Eastern Mediterranean and the African Regions <sup>(1)</sup>.

Worldwide, tobacco use causes nearly 6 million deaths per year, and current trends show that tobacco use will cause more than 8 million deaths annually by 2030 <sup>(2)</sup>.

The term addiction is defined by the WHO as “repeated use of a psychoactive substance or substances, to the extent that the user is: Periodically or chronically intoxicated, shows a compulsion to take the preferred substance(s), has great difficulty in voluntarily ceasing or modifying substance use, exhibits determination to obtain psychoactive substances by almost any means, and tolerance is prominent and a withdrawal syndrome frequently occurs when substance use is interrupted <sup>(3)</sup>.

The Fagerström Test for Nicotine Dependence is the most commonly used measure of nicotine dependence. It is a shortened version of the earlier Fagerström Tolerance Questionnaire FTQ<sup>(4)</sup>. It considered a measure of physical dependence, it also showed positive correlations with measures of psychological dependence such as loss of function, expected withdrawal symptoms and self-efficacy<sup>(5)</sup>.

The aim of this study was to determine the relationship between the smoker’s age, the age of initiation of smoking and FTND among male Sudanese smokers, at smoking cessation centerof Alshaab institute of cardio-pulmonary diseases in the period from August to December 2015.

**Methodology:**

This is a prospective cross-sectional survey conducted at the smoking cessation center of Alshaab institute of cardio-pulmonary diseases in Khartoum, Sudan in the period from August to December 2015.

All Sudanese smokers who attended the smoking cessation clinic in the study period, aged 18 years or above, smoked for the last six months on a daily basis and smoked the first cigarette of the day within 30 minutes of waking were included in the survey after obtaining an informed written consent.

We excluded the attendants of the center who had the following criteria: Stopped smoking for more than 24 hours before study entry, used any form of tobacco other than cigarettes such as cigars, pipes, smokeless tobacco or snuff or used any form of nicotine replacement therapy such as nicotine gum, nicotine patch, nicotine lozenges, nicotine inhaler or nicotine nasal spray within 30 days of study.

We collected data using a close-ended questionnaire which contained demographic data, the smoking history which includes age at which smoking was started regularly, duration of smoking and history of using drugs to help in smoking cessation.

We used the Fagerström test for nicotine dependence in scoring. The three yes/no items (do you find it difficult to refrain from smoking in places where it is forbidden?, do you smoke more frequently in the morning? and do you smoke even if you are sick in bed most of the day?), were scored 0 for (No) and 1 for (Yes). The two multiple-choice items (how soon after waking do you smoke your first cigarette? and how many cigarettes a day do you smoke?) were scored from 0 to 3 while the cigarette which the participant hates most to give up was scored 1 for the morning cigarette and 0 for any other cigarette. The items were summed up to yield a total score of 0-10. Nicotine dependence was classified as very low if the score was 0-2, low if 3-4, moderate if 5, high if 6-7 and very high if the score was 8-10.

We analyzed data using the International Business Machines statistical package for social science (IBM-SPSS) version 22. Frequencies, means, chi-square tests and independent t- test were used. We calculated the P-value using Chi- square test (P value <0.05 was considered significant).

We obtained ethical approval from the ethical committee at Alshaab teaching hospital.

### **Results:**

All the participants were males (n=55), with the mean age of 36.85 years. The mean age at initiation of regular smoking (at least one cigarette per day) was 20.09 years.

Around 31% of the participants started smoking before 11 years, 36.4% between (11-20 years), and 21.8% between (21-30 years) while only 11% started smoking after 30 years.

According to FTND, we found very high nicotine dependence in 30.9%, high in 23.6%, moderate in 7.3%, low in 14.6% and very low in 23.6%.

All participants aged 60 years and above were found to have very high nicotine dependence.

Around 63 % of the participants aged 50 to 59 years had very high nicotine dependence, while only around 12% of the participants aged 20 to 29 years had very high nicotine dependence (table 1).

Table (1): The relationship between the age at presentation and the nicotine dependence level based on FTND.

F T N D	A g e g r o u p				
	20 - 29 Years	30 - 39 Years	40 - 49 Years	50 - 59 Years	60 and above
V e r y l o w	1 0 . 9	1 0 . 9	0	1 . 8	0
L o w	7 . 3	3 . 6	3 . 6	0	0
Moderate Smoker	0	3 . 6	3 . 6	0	0
H i g h	9 . 1	5 . 5	5 . 5	3 . 6	0
V e r y H i g h	3 . 6	9 . 1	5 . 5	9 . 1	3 . 6

(*P* value= 0.002)

The relationship between duration of smoking and nicotine dependence is shown in table2.

Very low nicotine dependence was found in around 47% of the participant who initiate smoking at 10 years or earlier and 33% of those who started smoking at 41 years or later.

Very high nicotine dependence was found in (6%, 25%, 58%, 65% and 67%) of participants who initiates smoking (10 years or earlier , 11 to 20 years, 21 to 30 years, 31 to 40 years and 41 to 50 years.) respectively (table 2).

Table (2):The relationship between the age of initiation of smoking and nicotine dependence.

F T N D	A g e g r o u p					T o t a l
	1 - 10 Years	11 - 20 Years	21-30 Years	31 - 40 Years	41-50 years	
V e r y l o w	1 4 . 5 %	7 . 3 %	0 . 0 %	0 . 0 %	1 . 8 %	2 3 . 6 %
L o w	5 . 5 %	9 . 1 %	0 . 0 %	0 . 0 %	0 . 0 %	1 4 . 5 %
Moderate Smoker	1 . 8 %	1 . 8 %	3 . 6 %	0 . 0 %	0 . 0 %	7 . 3 %
H i g h	7 . 3 %	9 . 1 %	5 . 5 %	1 . 8 %	0 . 0 %	2 3 . 6 %
V e r y H i g h	1 . 8 %	9 . 1 %	1 2 . 7 %	3 . 6 %	3 . 6 %	3 0 . 9 %
T o t a l	3 0 . 9 %	3 6 . 4 %	2 1 . 8 %	5 . 5 %	5 . 5 %	1 0 0 %

(P value= 0.001)

**Discussion:**

Although cigarette smoking is common in Sudan no study was done regarding nicotine dependence. In this study, we found that increasing age was significantly associated with increasing nicotine dependence (P value= 0.002). This is similar to the result of an Indian study, however, Huijie found that the middle-aged smokers had higher nicotine dependence than the younger and older groups<sup>(6-7)</sup>.

Only a few studies have examined the association between nicotine dependence and initial age of regular smoking. In this study participants who initiated smoking at an early age were less dependent on nicotine than those who initiated later ( $p$ -value = 0.001). Vink et al. in Netherland found no association between the age of initiation of regular smoking and nicotine dependence, while Park and his group found that early age of initiation of smoking was associated with higher nicotine dependence<sup>(8-9)</sup>. This could be due to reduced total and renal clearance of nicotine by increasing age<sup>(10-11)</sup>. In addition, young people avoid smoking in public areas because of the Sudanese culture and this is reflected in less nicotine consumption and dependence.

**Conclusion:**

Older Sudanese cigarette smokers have higher nicotine dependence level than young smokers. Sudanese who initiated smoking at an early age was found to be less dependent on nicotine than those who initiated later.



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