

The relationship of nicotine dependence with age and socioeconomic status among current smokers in Moradabad city

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Abstract: *Background:* It is well known that nicotine is the primary factor responsible for dependency among smokers. Recent studies indicate age-associated changes in nicotine dependence (ND). The aim of this study is to assess the association of ND with age and to investigate the association with socioeconomic status (SES) among current smokers in Moradabad City. *Materials and Methods:* A convenient sample of 394 current smokers of 3 different age groups taken from urban areas of Moradabad. Data was collected using a self-administered 7 item questionnaire & standard Fagerstrom Test for Nicotine Dependence (FTND). Participants interviewed for demographic data, age, and socio-economic status by a single trained investigator. *Statistical Analysis Uses:* SPSS version 19.0. *Results:* About 85% of respondents said they hate to give up the first cigarette in the morning. Among the total respondents, 37.5 % of participants were semiskilled and unskilled workers, and 17.7% of participants were unemployed. Overall 36.5% of participants had a middle-level education (middle & high school). The mean FTND scores in the middle-aged group (35-50 year) was higher than in the younger (<35 years) and older (>50 years) age groups. The mean FTND Score of middle-aged is 6.8 whereas in younger and older is 3.81 and 2.65 respectively. Lower socioeconomic status was associated with higher FTND scores. *Conclusion:* The middle-aged group of smokers had higher nicotine dependence than the older and younger aged. The lower socioeconomic group also found to be having higher nicotine dependence.

Keywords: AGE, Nicotine Dependence, Socio-Economic Status, Smoking, Tobacco.

Introduction

The use of tobacco is increasing day by day among people and now has become a cause of preventable death worldwide [1]. Tobacco Control Policy India Project Report uncovered around 275 million clients in India. Its use is answerable for about portion of all malignant growths among male and one-fourth of all tumors among females and furthermore for cardiovascular and respiratory sicknesses. Except if and until pressing move is made, by 2020, tobacco consumption could cause more than 1.5 million death in India every year [2].

Nicotine is the primary factor liable for the dependence shaping properties of tobacco items and nicotine reliance is broadly perceived as one of the center factors in the support of tobacco smoking [3]. The incidence of smoking cessation varies with age [4] and multiple epidemiological examinations have concentrated on the

relationship between age and nicotine dependence. In fact, a population-based overviews recommend that age fundamentally influences nicotine dependence to such an extent that ND increments with age from 20 to 50 years of age, and afterward diminishes in smokers more than 50 years old [5-6].

Socioeconomic status refers to the position that a person occupies in the structure of society due to social or economic factors. Universally, smoking rates are especially high among the long haul jobless, homeless, intellectually sick, prisoners, single parents, and a few gatherings of new workers and ethnic minorities-every one of whom are bound to be financially burdened [7].

Further studies suggested that people in lower socioeconomic groups possibly have more nicotine dependency since they smoke more cigarettes and also tend to be daily smokers

more regularly than people with higher status [8-9]. Thus present study was carried out to assess the relationship of ND with age and SES.

Material and Methods

According to the WHO [10], some definitions are as follows. Smokers: Those who have/had smoked 100 or more cigarettes (or the equivalent amount of tobacco) during their lifetime. Current smokers: Those who meet the criterion of smokers, and smoke any tobacco product at the time of the survey. Current daily smokers: Those who meet the criterion of smokers, and smoke at least once a day at the time of the survey. Current occasional smokers: Those who meet the criterion of smokers, and smoke but not every day at the time of the survey. Ex-smokers: Those who meet the criterion of smokers, but do not smoke at all at the time of the survey.

Subjects: This cross-sectional study was conducted from August to October, 2019, among persons residing in urban areas of Moradabad. After a baseline study, a self-administered questionnaire with detailed smoking and ND items was given to individuals who smoked at least 100 cigarettes during their lifetime or they were current smokers. Persons aged 18 years was face-to-face interviewed by the well-trained investigators to complete a questionnaire that was designed based.

The total amount of valid questionnaires was 600, among which, 394 were for current smokers. Current occasional, Ex-smokers and individual having both smokeless and smoking form together were excluded from the study. Present study was approved by Institutional Ethics and Review Board of Kothiwal Dental College and Research Centre and all subjects provided informed consent.

Measurement of Nicotine Dependence: ND of the respondents was evaluated utilizing the Fagerstrom test for nicotine dependence (FTND) [11] which measured both physical and psychological tobacco dependence [12]. This FTND scale consists of six items. The total scores range from 0 to 10, with higher scores showing greater dependence. The 6 item under FTND

were first converted into hindi (the neighborhood language). Two investigators (a dentist and a psychologist) autonomously made an interpretation of the english variant into the local hindi language. The specialists came into an agreement on the interpretation of survey which was again back meant the first form for examination. Since no significant inconsistency was noticed (Cronbach's $\alpha=0.7$), the translated questionnaire version was utilized for the investigation.

Statistical analysis: Shapiro-Wilk test was used to check the normality and found that the data does not follow Gaussian distribution. As the data does not follow the homogeneity, Kruskal-Wallis test was used. Kruskal-Wallis one way analysis of variance is a non-parametric method used for comparing two or more independent samples of equal or different sample sizes. Statistical analyses were carried out using SPSS version 19.0.

Results

The mean age of all subjects in the present study was 44.98 years ranging from 20 to 80 years old. Among all the respondents, 128 (37.5 %) participants were semiskilled and unskilled worker and 70 (17.7%) participants were unemployed. Overall 160 (40.6%) participants had a middle level education (middle & high school). The mean FTND scores in the middle-aged group (35-50 years) was higher than in the younger (<35 years) and older (>50 years) groups. Mean FTND Score of middle-aged is 6.8 whereas in younger (<35 years) and older (>50 years) is 3.81 and 2.65 respectively. About 85% respondent said they hate to give up the first cigarette in the morning.

Table 1 shows a significant difference ($p<0.05$) between age groups, socioeconomic status, education, occupation with FTND score. The score is high in the middle aged (35-40 years) groups, low socioeconomic status groups, and unskilled and unemployed worker. However, monthly income is found to be non-significant with FTND score.

Table-1: Relation of FTND score with age and socioeconomic status			
	(n)	Average (FTND)	p-value
Age Groups			
Younger	132	3.81	0.00001
Middle	135	6.8	
Older	126	2.65	
Socio-Economic Status			
Upper	104	4.61	0.00001
Middle	130	3.03	
Lower	158	5.57	
Education			
Graduate	94	4.31	0.03
School	200	4.83	
Primary & Illiterate	100	3.94	
Occupation			
Professional	94	3.42	0.00001
Clerical & skilled	118	3.45	
Unskilled & Unemployed	182	5.69	
Monthly Income			
>414130	40	4.35	0.54
20715-41429	34	4.64	
15536-20714	64	4.34	
10357-15535	114	4.28	
<10356	142	4.70	
<i>Notes: FTND: Fagerstrom Test for Nicotine Dependence score; Score 7 to 10= highly dependent; 4 to 6 = moderately dependent; less than 4 points= minimally dependent; Younger=<35 year age; Middle= 35-50 year age, Older= >50 year age.</i>			

Discussion

Nicotine dependence, as a consequence of neuroadaptation by nicotine in the cigarettes, results in increased consumption of tobacco. Although several other factors are there but Age and socioeconomic status is found to be an important factor related to nicotine dependence [8, 13]. For assessing nicotine dependence, FTND was most widely used and is a good measure of physical and psychological ND [12]. The total score showed moderate internal consistency reliability in this study.

Result of the present study showed that level of ND was higher in the middle aged group current smokers as compared to younger and older aged group, which is found to be significant and undeviating with a study done by Huijie LI et. al. in the year 2015 among Chinese rural population. Results from the study showed that FTND score was highest in the age group 45-64 among the various age groups [13]. Present study is also

consistent with the study done by Park S et. al. in urban population [6]. They also showed that there is a significant relationship between nicotine dependence and age. They found that ND level increased until participants reached 50-60 years of age and then decline seen in all smoking initiation age groups. The result showed an inverse U-shape relationship between age and ND with age groups on X-axis and FTND score on Y-axis.

Present study reflects a higher FTND score in middle aged group, reason may be due to facing more smoking-related prompt from the surroundings such as immense pressure of life with routines of everyday life, family and work or being exposed to smell or sight of someone else's smoking with smoking friends, driving etc. These factors may cause psychologically reinforce nicotine dependence [14-15]. Further with respect to age, younger (<35) age groups reported higher competence

of quitting and also reported being more capable of not smoking when angry compared to middle aged group and older smokers and are unlikely to be reactive for psychological prompt for the urge to smoke [16-17].

There may likewise be many reasons for the decreasing inclination of nicotine dependence among older smokers. Nicotine delivery speed in brain becomes slow in older age group as the total nicotine clearance decreases by 23% and renal clearance decreases by 49% compared to younger and middle aged groups results in lower smoking urge and ultimately nicotine dependency [18]. With the increasing concern for wellbeing as the person becomes older and incapacitating health, suffering respiratory and cardiovascular disorder and decline in physical function naturally compels them to decrease the nicotine intake and attempt of quitting [14, 19]. At last, the limiting tendency of nicotine dependence in elderly may show up because of surviving attitude brought up by the higher death rate among smokers, the extensive cancer causing awareness program through advertisement due to tobacco use.

Results from the table 1 also showed that lower SES is associated with higher FTND scores and this in correlation with the study done by Allshine Chen et al. in the year 2019 [8]. They also showed that lower SES smokers smoke more frequently, have a higher level of dependence and tobacco smoke exposure. It was also found that a higher degree of nicotine dependence associated with a lower household income ($p=0.003$) and the mean FTND scores for all subjects was 4.4, but varied by job type with means of 5.1, 4.4 and 3.8 for those unemployed, blue-collar, and white-collar jobs respectively. Similarly present findings affirm as well as broaden the consequences of prior research done by Hiscock R, Bauld L et. al. indicating that people with lower SES are more likely to be daily smokers and to smoke more, and therefore, as smokers, to be more reliant on nicotine than individuals in higher SES [7].

This may be due to association of social disadvantage with financial and psychological stress [20] and or individuals with lower positions are more likely to share social environments therefore, and are hence increasingly subject to nicotine dependency. The common core elements

widely used to measure SES are education, income and employment [21]. As evident from the table 1 that lower education, unemployed and unskilled workers, lower income is associated with higher levels of FTND scores among current smokers. This is in accordance from the study done by Marjaana Pennanen et. al. among current smokers where they found lower education, lower income and blue-collar occupation increased the probability of higher dependence [9].

Higher dependency may be due to less health awareness among lower education level individuals; stress, anxiety, and break from the unorganized unskilled occupation sector. On the contrary for heavy workload individuals of organized sector employees may be deprived of smoking due to the growing number of the ban on smoking in the workplace leading to reduce in their consumption and dependency [22]. Though education and income has been used commonly as a proxy, methods were employed for having higher response rates including broad income categories and additional assurance of confidentiality of the query.

Conclusion

Present study established the relationship between nicotine dependence with age and socioeconomic status with an inverse U-shaped relation between age and nicotine dependence. The middle aged and lower socioeconomic smokers had higher dependence compared to the respective category. These data provide important information for the age and socioeconomic specific control policies related to tobacco.

Non pharmacological tobacco therapies like patient education, behavioral therapy, self-help material, and telephonic counseling will be responsive in the older age group due to their lower nicotine dependence. For younger smokers, strong divisive public health policies to be adopted or for children to stop smoking initiation among them. Particularly, they should be made aware of their life expectancy, ill effects and more addiction to it with moving age. In contrast, middle-aged smokers

due to more nicotine dependency may benefit more from active pharmacological therapies like nicotine replacement therapy, bupropion and varenicline support provided by the national cessation treatment program. In future, further

studies are necessary to develop new ideas for smoking cessation including treatment that target nicotine metabolism and its receptors to influence prior and tailored intervention.

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