NICOTINE USE PATTERNS AMONG DEPRESSIVE PATIENTS: INSIGHTS FROM A CROSS SECTIONAL STUDY CONDUCTED IN A TERTIARY MENTAL HEALTH CARE HOSPITAL

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Abstract

Aim: This study aimed to evaluate the tobacco use patterns and its severity in patients with depressive disorder. **Materials and Methods:** This is a cross sectional observational study conducted in an outpatient department of a tertiary care hospital. A total of 360 patients were screened over a period of 18 months in covid pandemic and further assessment were done using assessment scales and the dats was analysed. **Results:** About one third of the patients with depression consumed nicotine predominantly in the form of smokeless tobacco. More than half of the patients had severe dependence of nicotine. Symptomatic patients of depression shown more dependence to tobacco than remitted patient. The study also revealed a positive correlation between severity of depressive illness with severity of nicotine dependence

Keywords: Depressive Disorder, Tobacco Use, Nicotine Dependence, Correlation, Serverity of Tobacco Use.

INTRODUCTION

Though there is widespread awareness of smoking and its effect on cancer, heart disease, and respiratory disease, there is a lesser appreciation of its impact on psychiatric comorbidities [2–4]. People with psychiatric disorders smoke at an alarmingly increased rates[5] and are found to have greater nicotine dependence than the general population [6]. Various researches have found that the frequency of smoking among psychiatric outpatients was twice that of population based control groups [7]. The most widely prevalent and studied from of tobacco use is cigarette smoking, whereas in India the smokeless form of tobacco is mostly used [8]. Numerous studies suggest that chronic nicotine intake through smoking leads to neuroadaptations in many brain circuits, including those related to centers that govern the affect [9] resulting in strong association between nicotine use and depression[10–14]. People with current or past depression have shown to have greater daily tobacco consumption, nicotine dependence and smoking relapse than people without depression [5,15–17].The severity of depressive symptoms is related to the nicotine-dependent state than non-dependent ones [18–20].

REVIEW OF LITERATURE

The tobacco epidemic, one of the most significant public health threat the world has ever faced, has engendered a colossal burden of illness and premature death across the globe, killing more than 7 million individuals annually [23]. About 100 million deaths,

mostly in developed countries resulting from tobacco use in the 20th century. The WHO framework convention on tobacco control (WHO FCTC) in 2013 stated that, tobacco kills approximately 6 million people which is predicted to escalate upto 8 million deaths a year by 2030[24]. According to the World Health Organization, tobacco use in any form causes about six million deaths globally, one-fifth of them occur in the Southeast Asian region alone [25]. If current pattern persist, tobacco will kill about one billion people this century, mostly in low and middle income countries.

In India, smoking tobacco was attributed to 0.9 million deaths in a year [26] whereas another 0.35 million deaths were due to smokeless tobacco [27].The World Health Organization predicts that tobacco deaths in India may exceed 1.5 million annually by 2020 [28]. However, considerable research are inadequate in comprehending the actual trends. Nationally representative and reliable prevalence data on tobacco consumption are scarce. The existing studies on prevalence of tobacco use are based on non-representative sample surveys or have been conducted in localized, mostly urban geographical area.

Nicotine Use - Pattern And Prevalance

Tobacco obtained from the plant *Nicotianatobaccum*, member of Solanaceae family , carries in its leaves quantities of an alkaloid- Nicotine one of the most widely used psychoactive substance that gives power over man's mind, the foremost cause of preventable death in the world, and India, which is the second largest country occupies a very special place in the world tobacco map, sharing the global burden of tobacco-induced disease and death as the second-largest producer and consumer of tobacco in the world [29]According to an Indian Council of Medical Research (ICMR) report, India ,the fourth largest producer of tobacco and second in the world in cigarette and bidi production. There are 18.4 crore tobacco users in India with 4 crores using cigarette, 8 crores using bidis and 6 crores using chewable forms of tobacco. Nearly 45% of Indian men and 12% of women consume some form of tobacco.

Tobacco use in India is characterized by a high prevalence of smoking and smokeless tobacco use, with dual use also contributing a noticeable proportion.

Smoking Practices: Tobacco is smoked in the forms of

Bidi - Bidi cigarettes are small, thin, slightly conical smoking sticks that contain ±0.2 g of flaked tobacco wrapped in a temburni or tendu leaf (plants native to India). This hand-made roll is secured by a thread at one or both ends.[30]

Cigarettes- Cigarette smoking is common in urban areas. However more common among the upper and middle socioeconomic classes than among the poor population [31].

The fact is that tobacco smoking is the most popular form of tobacco consumption in the world. However, any estimation of tobacco-related disease burden is incomplete without addressing the Smokeless tobacco (SLT) component [8]. SLT use has become much more widespread than previous estimates and has been documented in more than 120 countries in every WHO region [34]. Smokeless tobacco deliver nicotine primarily through the oral mucosa upon placement in the mouth which may be chewed, sucked, or held between the gum and teeth for variable time intervals and, in some cases, swallowed in whole or part.

Forms of Smokeless tobacco chewing include- [29] Khaini, Betel quid, Pan masala, Snuff and Gutka

At global level in 2018, 38.6% of males age 15 years and older used some form of tobacco on a current basis. The prevalence of current tobacco smoking was 32.4% among males in 2018. Of male tobacco smokers, 85% were cigarette smokers[35]. In a large population based study, the prevalence of smoking in urban Delhi among people aged 25-64 years during 1985-1986 was 24.5%, and these rates were higher among men (45.0%) than among women (7.0%)[36].

Among 1130 people aged 25-64 years in 1990, Kutty et al reported a prevalence of 21.9% in a rural population in Kerala, but the definition of smoking was not reported [37]. In another cross sectional self report study in urban community of Bombay by Gupta et.al with 99598 individuals showed 69.3% prevalence of current tobacco use in men, out of which 23.6% were smokers [38].

The National Family Health Survey provided data from 301,984 adults in 26 Indian states during 1999. In this impressive sample, the overall prevalence was 18.4% for tobacco smoking and 21% for tobacco chewing [39]. Although many studies have described the sociodemographic profile of tobacco use in South Asian region, very few have tried to examine exclusive categories of tobacco use such as smoking only, smokeless use only and dual use [39,43–45].

The data analysis of Global Adult Tobacco Survey (GATS) India 2016-2017, having a sample size of 74,037 adults aged greater than 15 years comprehensively investigates the socio-economic, demographic and knowledge-related factors associated with type of tobacco use in India which concludes that Tobacco consumption is 42.4% among males was distributed among the three types of uses – chewable, non chewable and dual [42].

In a community based cross sectional study conducted in Ballabgarh district of Haryana by Vivek et al in 2003-04, resulted in 25% smoking, 12% smokeless and 1.9% dual pattern of use in urban background and 47.9% smoking, 6.8% smokeless and 2.1% dual use pattern of tobacco use in rural background [41].

Smoking and dual use of tobacco among males were more common in the younger and middle-aged adults [46]. Age has been found to be an important determinant of tobacco use in earlier studies [29,46,47]. The numbers of the individual in the age more than 40 years were 1.5 times more than in the age of less than 30 years. Tobacco use was found more common among the uneducated people in the country [46].

Multilevel cross sectional analysis of the 1998-1999 Indian national family health survey of 3,01,984 individuals in 26 states resulted in Smoking and chewing tobacco are systematically associated with socioeconomic markers at the individual and household level. Individuals with no education are 2.69 times more likely to smoke and chew tobacco than those with higher levels of education. As education increases, the odds of smoking tobacco were significantly decreased.

Marital status was also predictive of smoking as single, widowed, and divorced or separated people were less likely to smoke, also observed religion-based differences, Christians and the residual category of "other religion" were less likely to smoke than Muslims or Hindus [39]. Being poor was significantly associated with a higher risk of use of smokeless and dual use tobacco among males.

In an attempt to study the burden of tobacco by Jang Bahadur Prasada and Muralidhar in 2017 by collecting data about the prevelance of tobacco obtained from the 61th (2004-05), 62th (2005-06), 64th (2007-08), 66th (2009- 10) and 68th (2011-12) round of National Sample Survey Organization (NSSO) concluded that Age, sex, education, religion, social group, sectors and household type were significantly associated with smoking tobacco (P < 0.001) [48].

Nicotine use and psychiatric disorders:

The emerging global economy, widespread marketing of tobacco products and the vulnerability of mentally ill persons make it likely that persons living with a mental disorder in developing countries use tobacco products at a disproportionately alarming rate[1]. Hughes et al in the year 1986, studied the frequency of smoking in a group of 277 psychiatric outpatients and found it to be twice that of population based control groups [7]. Lasser and colleagues studied the prevalence of smoking with and without a psychiatric disorder were to be 41% and 22.5% respectively [56]. Among psychiatric outpatients, the prevalence of smoking was found to be as follows: schizophrenia 88%, mania 70%, depression 49%, anxiety disorders 47%, personality disorders 46%, and adjustment disorders 45% [7].

Psychiatric Comorbidity of Smoking and Nicotine Dependence:

A large-scale multisite study of psychiatric disorders in the United States, The Epidemiologic Catchment Area Study (ECA), revealed that comorbidity of psychiatric disorders is far more pervasive than previously suspected [12] Glassman et al, in 1993 commented that regardless of the studies there is a compelling evidence between smoking and depression [57] Only few studies have been published that provides data on tobacco use among psychiatric patients in India, Srinivasan and Thara (2002) studied 510 male psychiatric patients and reported that the prevalence of smoking was 38% among patients with schizophrenia, 24% among patients with mood disorders, and 23% among those with a non-psychotic disorder [58]. In another well acclaimed study conducted at a major psychiatric hospital in southern India, the prevalence of tobacco use and nicotine dependence in 988 Patients were assessed, out of which 351 patients (36%) reported current tobacco use, with 227 (65% of all users) reporting moderate to severe nicotine dependence [1].

Following are some of the Hypotheses that accounts for increased rates of smoking in Psychiatric disorders:

1) Shared genetic factors that determine vulnerability to both smoking and Psychiatric Disorders.

2) Self medication by cigarette smoking for clinical symptoms, medication side effects, and cognitive deficits associated with mental illness

3) Common environmental factors such as stress that can increase expression of smoking behavior and the onset of psychiatric symptoms [59,60].

Depression:

The total number of people living with depression in the world amounts to 322 million, making it the single largest contributor of nonfatal health loss globally in the year 2015 [61,62]. Sociodemographic factors such as female sex, nuclear family, being widowed, unemployed status, low socioeconomic status were significantly associated with depression (P < 0.05)

Nicotine use and depression:

The prevalence of tobacco use has been found to be persistently higher in patients with Depression than that in the general population. The results have been supported by studies done in the general population [64] as well as in the non- representative clinical population [65]. Cross- sectional studies report that over 30% of patients with current depression are daily smokers [66]. Nearly 60% with a lifetime history of depression are current or past smokers [56]. Conversely smokers, as compared with nonsmokers have significantly higher rates of lifetime depression [19]. About one-third of patients with depression reported of current tobacco smoking. In addition, about 60% of patients with a current diagnosis or past history of depression were found to be smoking either currently or in the past [64]. Depression is found to be one of the major causes of initiation of tobacco smoking [40]. It is also a risk factor for a larger habit size and a shorter time to the first cigarette of the day[41].

Numerous Cross-sectional and longitudinal studies have indicated significant comorbidity between nicotine use with lifetime depression [5,6, 20,2122,23,24] than in the general population validating the causal linkage between both psychiatric conditions. Three plausible hypothesis can explain the association between smoking and depression as stated by Kendler et al in his work done in 1993 [69]. Though there were multiple hypothesis and Longitudinal prospective studies have attempted to explain the mechanisms of the association by charting the timeline of smoking behavior and depression. The direction of causality of smoking psychopathology association has not yet been fully understood [73].

Comorbidity research examining specific levels of smoking has indicated that depression is most strongly associated with heavy smoking and nicotine dependence rather than with lower levels of use [12,74,75].In contrast, an examination of increasing levels of depressive symptoms and/or subtypes of depressive disorders has not been pursued, to our knowledge. With few exceptions [18], epidemiologic studies that have reported the association between depression and smoking have exclusively inspected the category of major depression rather than other depressive subtypes. Smoking prevalence is higher among severely depressed than among mildly and moderately depressed patients [75].The Third National Addictions Survey (1998) conducted by the Mexican Ministry of Health, representative of Mexico's civilian population residing in cities and towns with 2500+ inhabitants, current smokers had twice the odds of elevated depressive symptomatology than never smokers only those smoking a pack or more a day had greater odds of depressive symptomatology [76]. Nicotine-dependent smokers have more severe depressive and than non-dependent smokers in a 13-year longitudinal study [77].

Lacunae in the existing literature and rationale for the study:

Nicotine use and depression has been vastly with respect to the socio demographic determinants, its pattern, prevalence and associated morbidity. Most of the studies done are in the western world where the route of nicotine use is predominantly in the smoking form.Whereas in India, majority of people use nicotine in smokeless form. Although there is a vast majority of studies establishing the association between nicotine use and depressive episode, but the pattern of use in symptomatic and remitted patients and further association with severity of depressive episode is rarely studied.

As evident by the extensive review of literature, there is paucity of Indian studies in this particular domain. Thus the current study was conducted to fill the existing lacunae in this field of research.

Aim:

To study the Nicotine use pattern in patients of Depression

Objectives:

1) To study the patterns of tobacco use in terms of its route, frequency and quantity in patients with Depressive episode.

2) To study the severity of tobacco use in terms dependence in patients with depressive episode.

3) To compare the severity of tobacco use in symptomatic and remitted patients with depressive episode.

MATERIALS AND METHOD

Study Design- cross sectional observational study

Universe of study- Patients diagnosed with Depressive episode attending the outpatient department of a mental health care hospital.

Study population- Patients attending the Out Patient Department psychiatry of IHBAS and diagnosed with Depressive episode as per ICD-10 DCR formed the study population.

Study sample:

The sample was selected over a period of 18 months.

Size- A total of 156 patients attending IHBAS OPD with diagnosis of depressive episode as per ICD-10 DCR were selected for the study. Sampling was done using random sampling method and to avoid bias, the first two patients fullfilling the inclusion and exclusion criteria and consenting to the study after explained in detail about the nature of the study.

If the Inclusion and exclusion criteria are not fullfilled the next patient was screened consecutively. There were also days when no patients were eligible for the study.

Selection criteria of patients:

Inclusion criteria:

1) Patients diagnosed with depressive episode (F 32) and recurrent depressive disorder (F 33)as per ICD-10 DCR criteria attending psychiatry OPD .

2) Patients diagnosed with depressive episode (F 32) and recurrent depressive disorder (F 33) as per ICD-10 DCR criteria currently in remission

3) Males in the age group of 18-60 years.

4) Patients who consented for the study willingly after they were informed the nature and purpose of study.

Exclusion criteria:

1) Patients diagnosed with Severe depressive episode according to ICD-10 DCR criteria .

2) Patients who were having suicide risk or psychotic symptoms.

3) Patients with bipolar affective disorder (F 31), post schizophrenic depression (F20.4).

4) Patients with comorbid substance use except tobacco and caffeine.

5) Patients with co-morbid Axis -I Disorder except Depression.

6) Patients having debilitating physical or neurological illness which can interfere with patient's assessment.

Tools for the study:

1) Semi structured pro-forma for sociodemographic variable with the purpose of collecting detailed information about the sociodemographic parameters of the subjects who participated in the study.

2) Semi structured proforma for clinical details to collect information for assessing the clinical status of subjects which included history taking, general physical examination.

3) ICD-10 DCR criteria for clinical diagnosis of Depressive episode (F32) and Recurrent depressive disorder (F 33).

4) MINI 7.0.2 augmented was used for ruling out other psychiatric comorbidities and substance use which explores Axis I diagnosis compatible with ICD -10 DCR Criteria

5) Hamilton -Depression Rating scale (HDRS) was used to assess the severity of depressive episode

6) Modified Fagerstrom test for nicotine dependence (MFTND)

7) Modified Fagerstrom test for nicotine dependence- smokeless tobacco (MFTND-ST)

METHODOLOGY

Patients who presented to IHBAS Psychiatry OPD with diagnosis of Depressive episode (F32) and Recurrent Depressive disorder (F 33) as per ICD 10 DCR criteria were considered for the study after obtaining informed consent. The assessment of the patient was initiated on the same day maintaining the COVID precautions with safe distancing and personal protection. After they fulfilled the inclusion and exclusion criteria and other Axis -I disorders were ruled out with the help of MINI questionnaire and detailed clinical interview.

A total of 360 patients were screened initially out of which 149 patients met the inclusion criteria (12 patients refused to consent for the study, 11 did not meet the age criteria) Among these 126 patients, 32 were excluded (13 patients had comorbid substance use, 8 patients had comorbid AXIS 1 disorder, 8 were receiving NRT and 3 had neurological illness). 94 patients were taken up in the study out of which 20 did not have history of nicotine use

Thus finally 74 patients were included in the study who were assessed in the following manner. The individual assessment was carried out in a single interview lasting for 40-50mins.

1) Assessment of sociodemographic profile with a semi structured proforma.

2) Assessment of patient's clinical status by semi structured proforma for brief history taking, general physical examination and mental status examination and using the MINI Questionnaire augmented with history taking to rule out other comorbidities.

3) Assessment of severity of depression by Hamilton Depression Rating scale.

4) Assessment of nicotine use, if any in life time and the pattern (route, form and severity) of use in patients with current nicotine use.

5) Application of Modified Fagerstrom test for smokers and smokeless tobacco users respectively.

ANALYSIS OF DATA

Data obtained were described for socio-demographic variables, nicotine use (pattern in terms of route, frequency and severity), depressive illness variables, severity of symptoms, stage of readiness to quit tobacco use. All these variables were studies using statistical package for social sciences (SPSS version 25.0) and the data was analyzed. Frequencies and percentages were used for descriptive data. Analysis was done on the type of nicotine use - pure smokers, pure smokeless tobacco users and mixed users. As the data obtained were not normally distributed, non parametric tests were used for further analysis. Spearman correlation test was used for studying the association between severity of nicotine use (MFTND Scores) and severity of depressive episode (HDRS Scores). Categorical data were analyzed using Chi-square analysis and a significance level of 5% was used ($P = 0.05$) which was applied for studying the statistical difference between severity of nicotine use in symptomatic and remitted patients of depression.

RESULTS

Table 1: Description Of Socio-Demographic Data In Patients Of Depression (Categorical Variables N = 74)

CATEGORICAL VARIABLE		FREQUENCY (n)	PERCENTAGE
AGE OF THE PATIENT	18- 25 Years	13	17.6
	26-35 Years	24	32.4
	36-45 years	25	33.8
	46-55 years	10	13.5
	>55 years	2	2.7
EDUCATION STATUS	Illiterate	8	10.8
	Lower primary	3	4.1
	Upper primary	21	28.4
	Secondary	36	48.6
	Graduation	6	8.1
OCCUPATION	Unemployed	14	18.9
	Unskilled	29	39.2
	Skilled	21	28.4
	Professional	10	13.5
MARITAL STATUS	Married	54	73.0

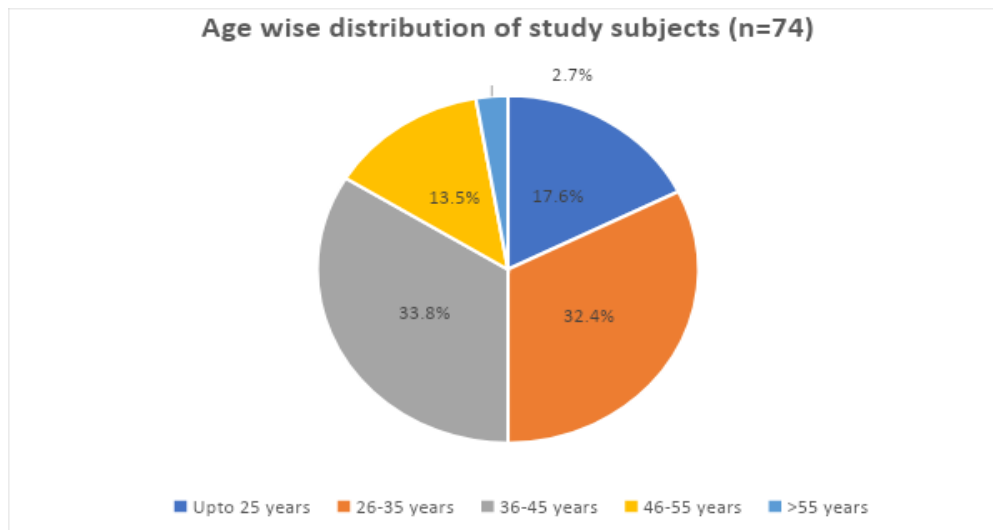| | Unmarried | 20 | 27.0 |
FAMILY TYPE	Nuclear	30	40.5
	Extended nuclear	23	31.1
	Joint	21	28.4
RELIGION	Hindu	51	68.9
	Muslim	23	31.1
BACKGROUND	Urban	45	60.8
	Rural	29	39.2

Age:

Figure 1

Patients who were included in the study were in the range of 18-60 years. The mean age of patients was found to be 36.15 + 10.18 years.
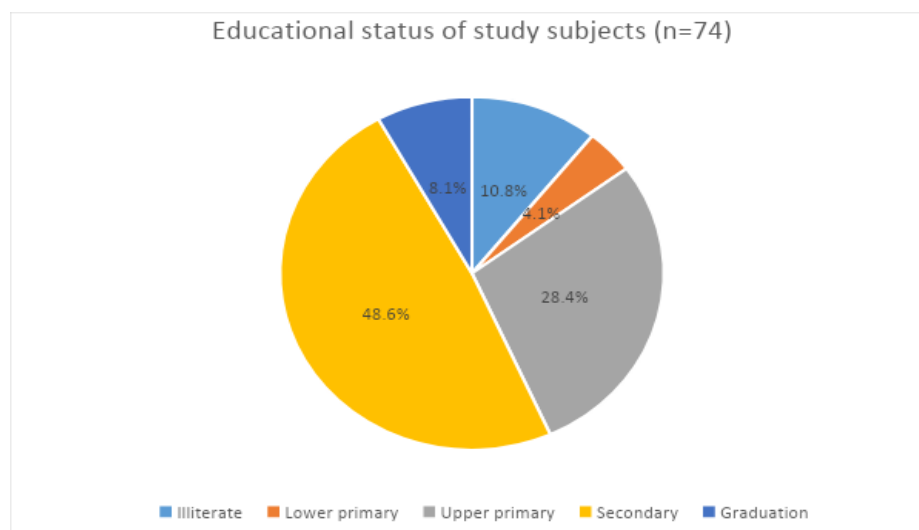
Educational status:

Figure 2

10.8% of the study population were not formally educated.

33.5% of the group were educated upto primary school

48.6% completed their secondary school and 8.1% were graduates.

Occupation:

Occupation wise distribution of study subjects (n=74)

13.5% 18.9% 28.4% 39.2%

■ Unemployed ■ Unskilled ■ Skilled ■ Professional
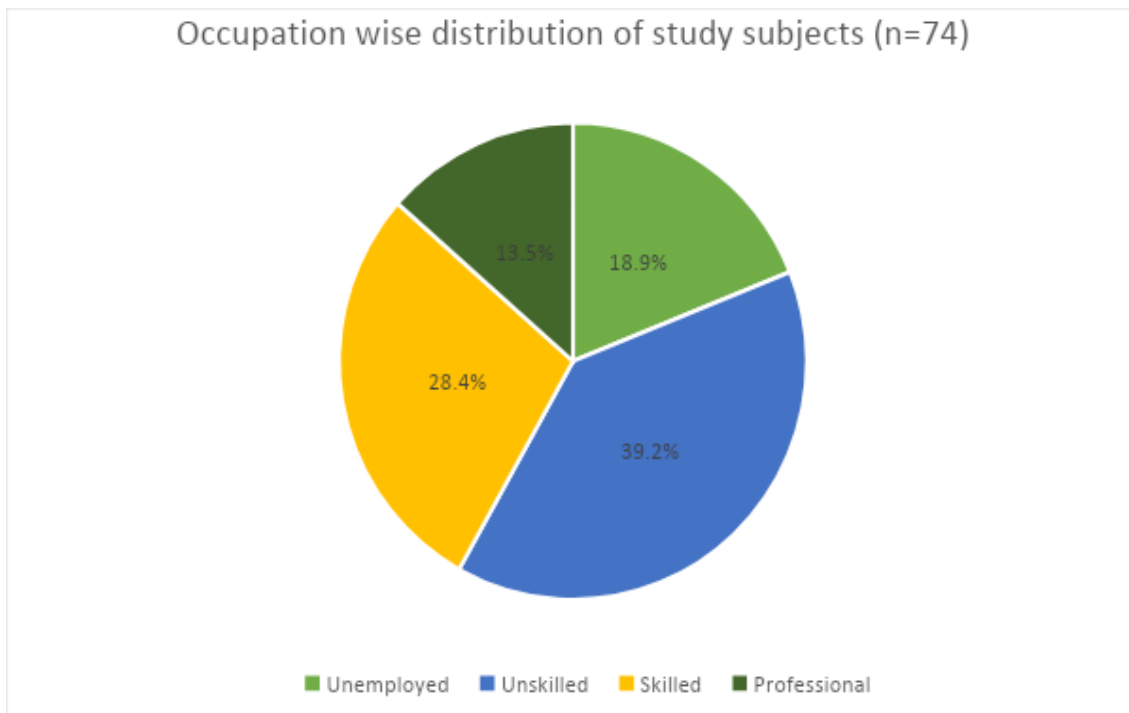
Figure 3

Among the 81.1% of the study population who were employed, 39.2% were unskilled, 28.4% were skilled,13.5% were professional.

Marital status:

Marital status of study subjects (n=74)

27.0% 73.0%
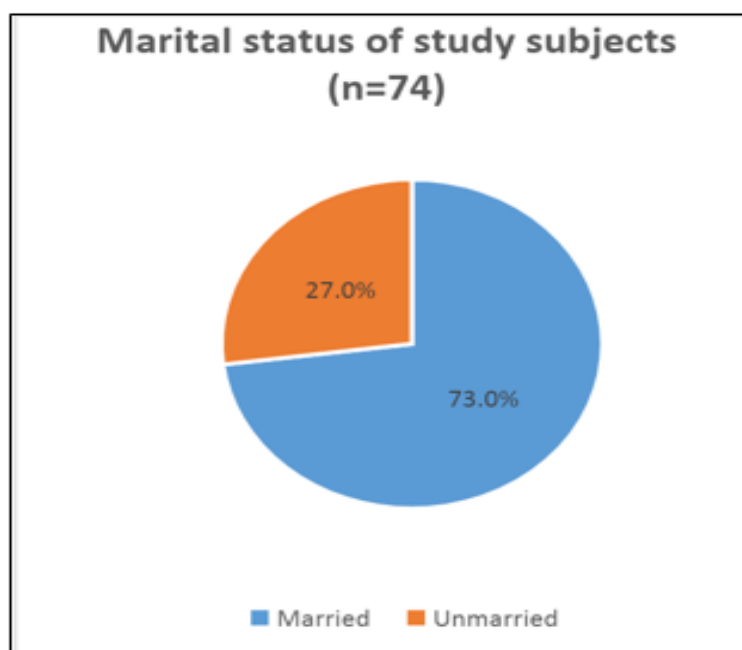
■ Married ■ Unmarried

Majority of the patients, 73% (54 patients) were married and rest 27% (20 patients) were unmarried.

Family type:

Majority of the study population comprised of nuclear and extended nuclear family being 40.5% and 31.1% respectively. Rest 28.4% belong to joint family.
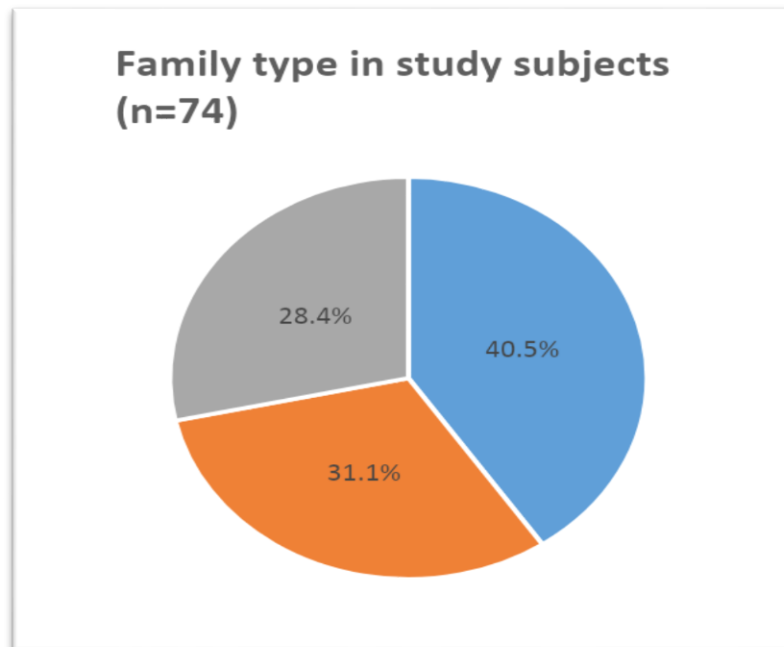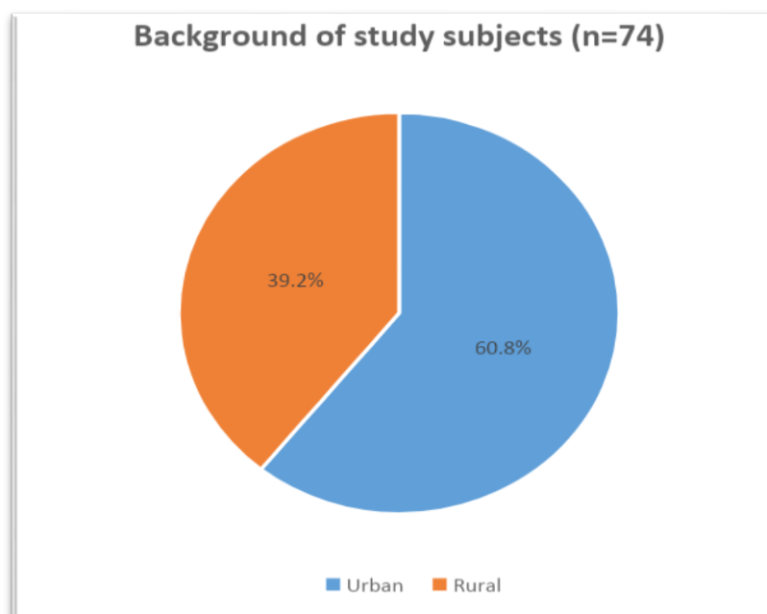

Figure 5

Background

Figure 6

It was observed that most of the patients belonged to urban background (60.8%). The study was carried out in an institute located in East Delhi which may have affected the above mentioned finding.

Table 2: Distribution of the patients in terms of current clinical status of depression

Table 2a: Clinical status of depression in study subjects (n=74)

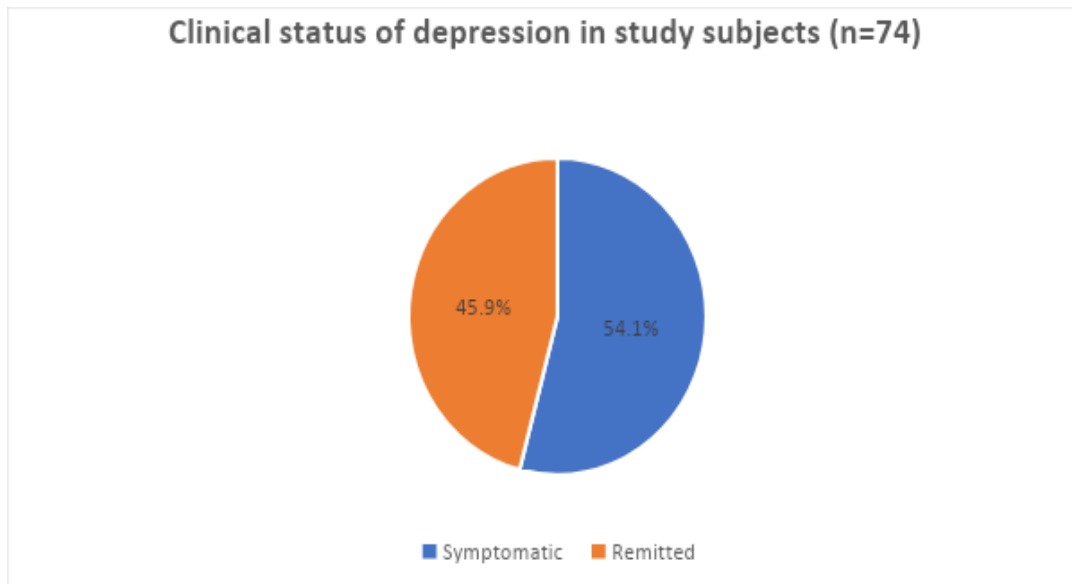| Clinical status of depression	frequency	Percentage (%)
Symptomatic	40	54.1
Remitted	34	45.9
Total	74	100

Figure 7

In the sample out of 74 patients, 40 patients are symptomatic and 34 patients are in remission.

Table 2b: Severity of depression in study subjects (n=40)

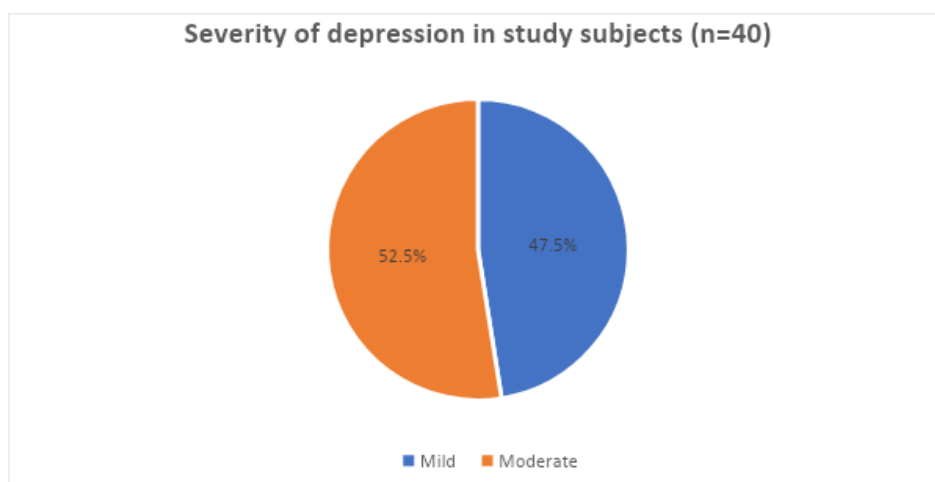| Severity of depression	Frequency	Percentage (%)
Mild	19	47.5
Moderate	21	52.5
Total	40	100

Figure 8

Out of the symptomatic patients of depression, 19 were of the mild depressive severity and 21 of moderate severity.

Distribution Of The Patients In Terms Of Tobacco Use

Table 3a: Type of tobacco use in study subjects (n=74)

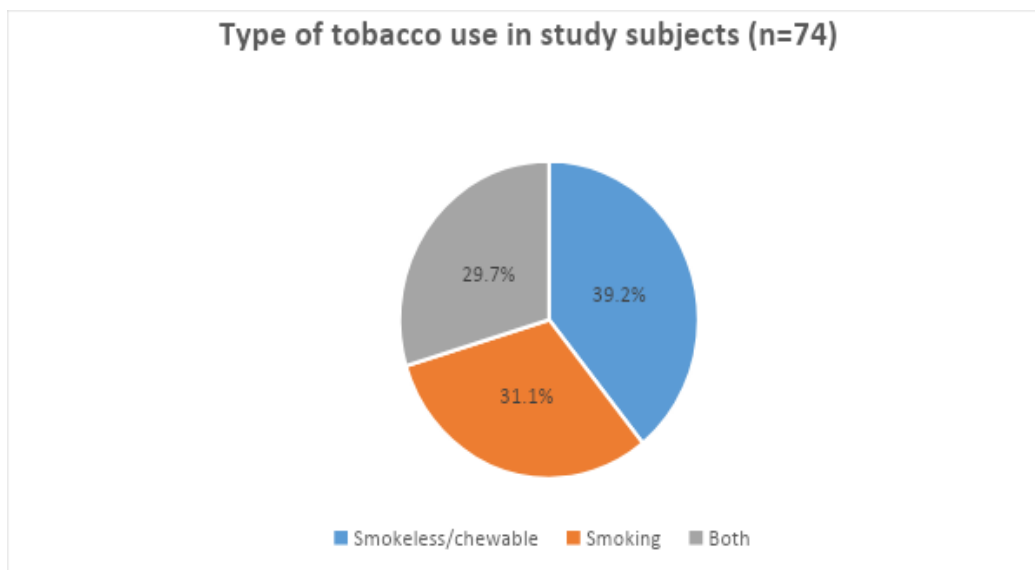| Type of tobacco use	frequency	Percentage (%)
Smokeless/chewable	29	39.2
Smoking	23	31.1
Mixed use	22	29.7
Total	74	100

Figure 9

Out of the 74 patients using tobacco, 29 patients (39.2%) preferred smoking, 23 patients (31.1%) preferred chewable forms of tobacco and 22 patients (29.7%) used both the forms of tobacco.

Table 3b: Distribution Of Patients In Terms Of Frequency Of Tobacco Use (N=74)

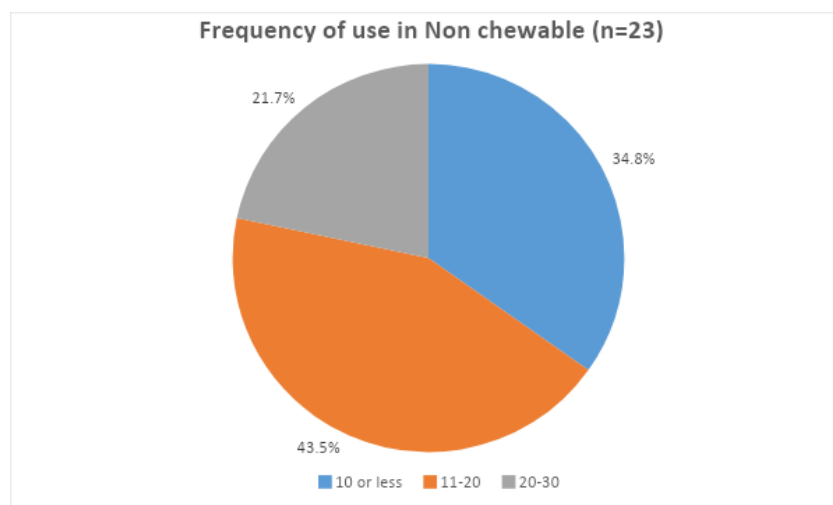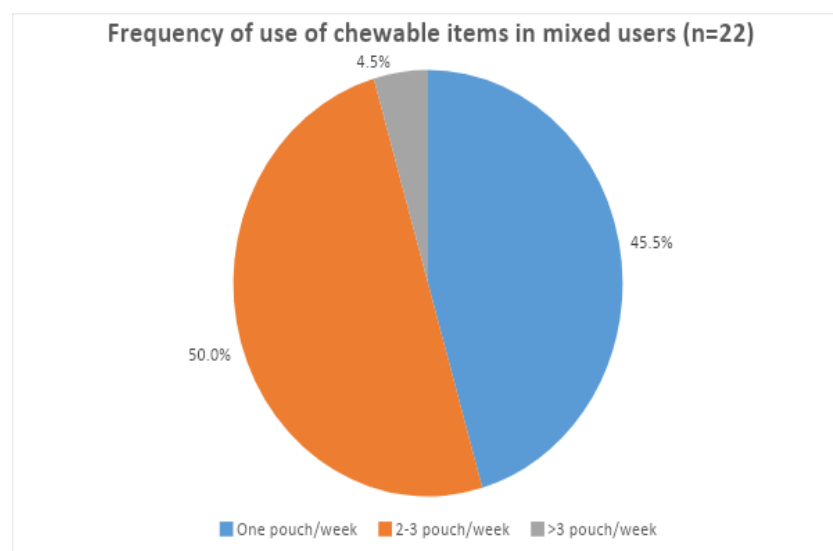|	Frequency	%
Chewable (n=29)		
One pouch/week	10	34.5
2-3 pouch/week	11	37.9
>3 pouch/week	8	27.6
Non chewable (n=23)		
10 or less	8	34.8
11-20	10	43.5
20-30	5	21.7
Mixed smoker (n=22)		
One pouch/week	10	45.5
2-3 pouch/week	11	50.0
>3 pouch/week	1	4.5
Mixed non smoker (n=22)		
10 or less	14	63.6
11-20	6	27.3
20-30	2	9.1
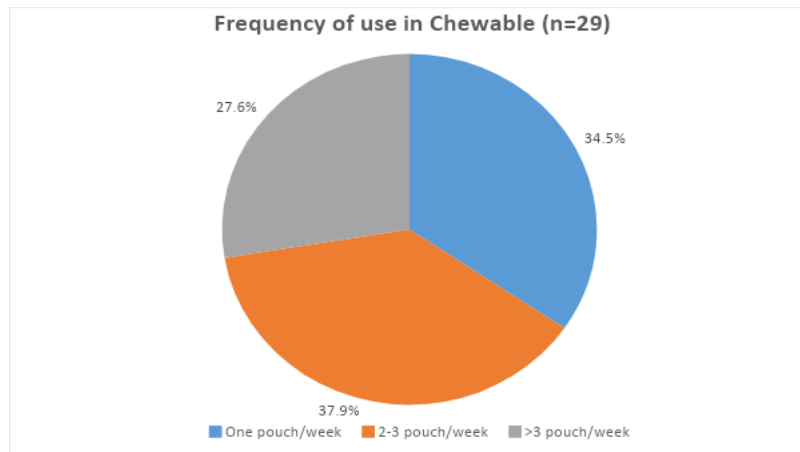
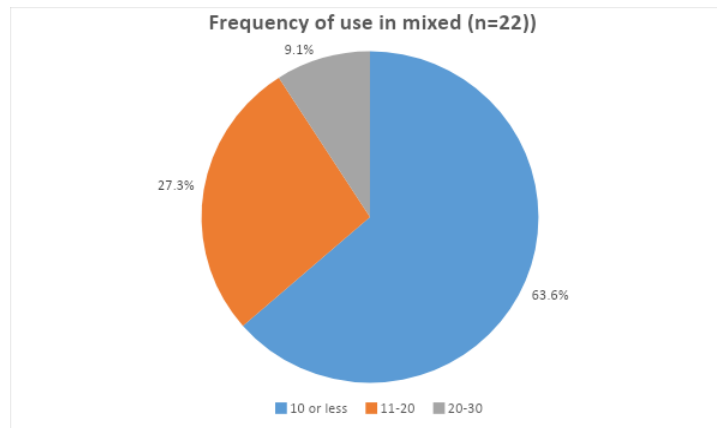**Figure 10**

Figure 11

Figure 12

Figure 13

Table 3c: Severity of nicotine dependence in smoker and smokeless tobacco users(N=74)

Severity of nicotine dependence	Smokeless tobacco user (n=29)	Smoker tobacco user (n=23)	Mixed use (n=22)	TOTAL (n=74)
Mild	13 (44.8%)	8 (34.8%)	7 (31.8%)	28(37.0%)
Moderate	9 (31.0%)	12 (52.2%)	12 (54.5%)	33(44.0%)
Severe	7 (24.1%)	3 (13.0%)	3 (13.6%)	13(17.0%)
	29(100%)	23(100%)	22(100%)	74(%)

Out of the 74 patients , the severity of nicotine dependence was measured using the MFTND and MFTND-ST Questionnaire which resulted in 37%, 44% and 17% in mild, moderate and severity dependence. Further nicotine dependence was studied according to the form of tobacco use – smokeless, smoking and mixed pattern of use. As the data was analysed it was found that Patients with

- Smokeless Pattern –44.8% mild ,31.0% moderate and 24.1%severe nicotine dependence

- Smoking Pattern –34.8% mild , 52.2% moderate and 13%severe nicotine dependence

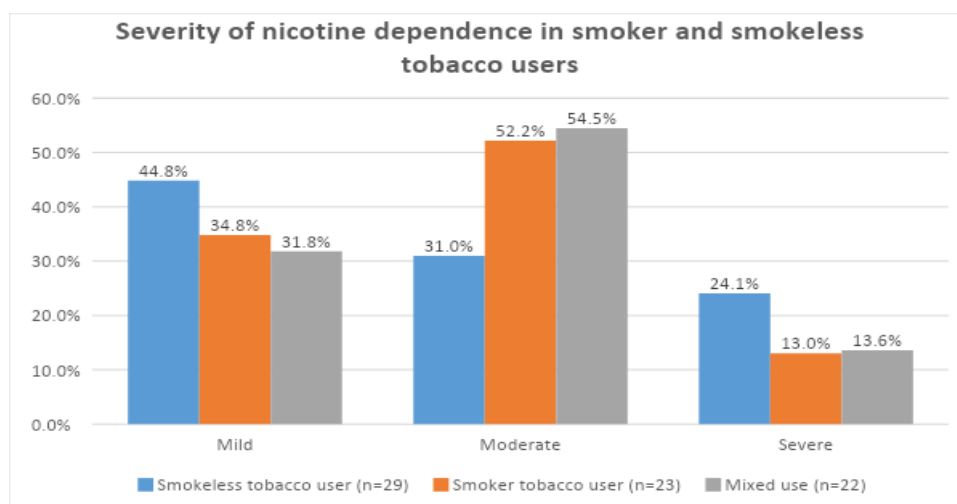- Mixed Pattern – 31.8% mild , 44 % moderate and 17%% severe nicotine dependence
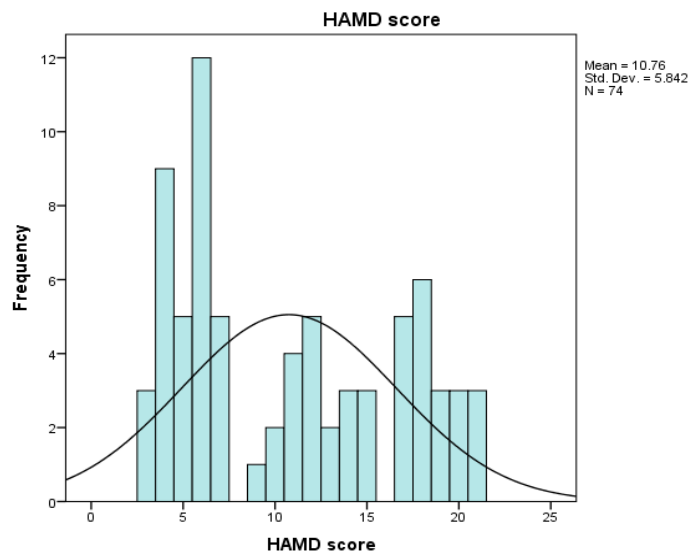

Figure 14

Figure 15

The mean of HAMD score is 10.76 with S.D of 5.842. For a study sample of 74 patients, the score is not normally distributed.
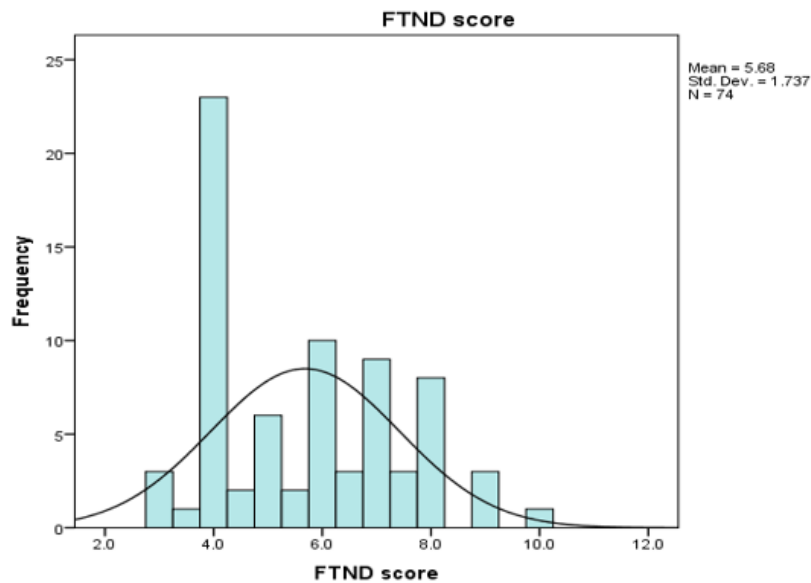
Figure 16

The mean of MFTND is 5.68 with SD of 1.737.

Relationship Between Severity Of Depression And Nicotine Dependence

Table 4a : Correlation between HAMD score and MFTND score

		HAMD score
FTND score	r value	**0.82**
	p value	**<0.001**

As both MFTND and HAMD score was not normally distributed, non parametric tests (Spearman correlation coefficient) was used to explore the correlation between the two variables.

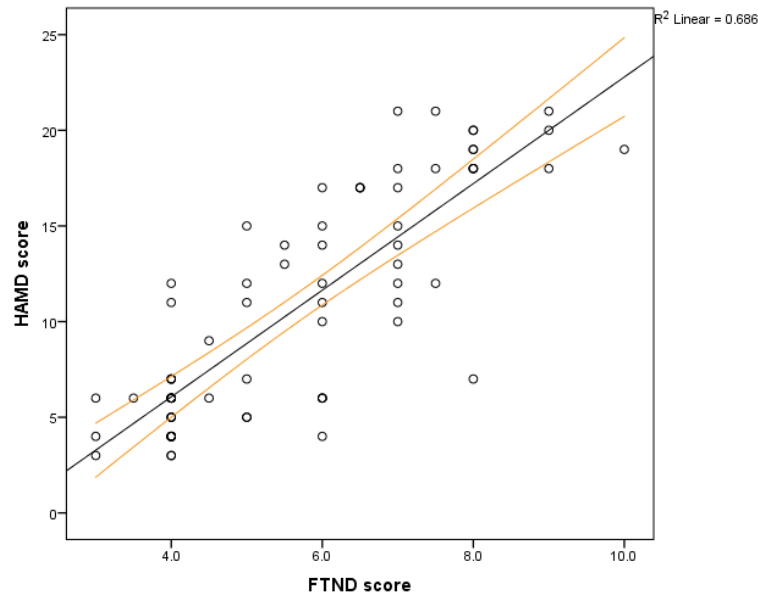**Figure 17**

The scatterplot depicts the correlation between HAMD score and combined MFTND score. Individual points represent individual cases. The black trendline represents the general trend of correlation between the two variable. The area between both orange lines represent the 95% confidence interval. The correlation was statistically significant with rho=0.82, P value<0.001

DISCUSSION OF METHODOLOGY

The current study was conducted in Institute of Human Behaviour and Allied Sciences (IHBAS), a tertiary care neuropsychiatric hospital, located in East Delhi.

The decision of choosing the patients of Depression and studying them is because of the significant burden both nationally and globally association between Nicotine use and Depression have been studied extensively in the past decades, yet the relationship is not clearly understood. While there are many studies conducted in the past on smoking pattern in Depressive disorder, but the studies on smokeless pattern are minimal.

Discussion on sampling:

This is a cross sectional study conducted in patients of depressive disorder who visited the psychiatry Out patient department at IHBAS. A sample of 74 patients were selected by random sampling. Systematic randomization was not possible due to COVID pandemic so in order to achieve some randomness and avoid bias during selection. The first 2 patients who were diagnosed with depressive episode in psychiatric OPD were approached for the inclusion in the study.

Discussion of results:

Numerous studies on Nicotine use in Depression have been published, which have mainly come from western countries focusing mainly on nicotine use in the form of cigarette smoking, whereas in India there is a vast population who use nicotine in the smokeless form. The present study was done in an attempt to further explore about the nicotine use pattern, frequency and severity in the patients of Depression.

Discussion On Sociodemographic Variables:

The tobacco use and dependence differs considerably with socio-economic and demographic characteristics of the adults, and the finding conforms to several earlier studies [33,42,46–48,104–107] The current study sample consisted of 74 male patients with a mean age group of **36.15 years**. Age is a significant demographic determinant associated linearly with tobacco use, and the finding has been documented earlier by several studies [46,47,108] (Daniel et al., 2008; Rani et al., 2003; Singh & Ladusingh, 2014) use of tobacco among males were more common in the younger and middle-aged adults [42] and the current study also has shown similar results.. Tobacco use was found more common among the not formally or less educated people, and the finding is in agreement with earlier studies[46,108]. It was one of the most important determinants of tobacco use irrespective of the type of use. This can often be attributed to less knowledge and awareness among the less educated people [42]. In present study majority of depression patients were from nuclear families (40.5%) and extended nuclear families (23%) similar finding have been previously seen in literature. As a matter of fact, depression and its symptoms often are more pronounced among patients lacking adequate social support. Other socio demographic factors in the present study revealed that majority of patient were from urban background (60.8%) and unemployed (18.9%) or having unskilled job as their profession (39.2%). People engaged in the skilled/unskilled manual job are most vulnerable to the risk of tobacco use.

Discussion on Pattern of Nicotine Use In Depression:

The different studies done on tobacco use at global, national and local level were stated in the review of literature [104], both in normal population based survey and patients of depressive disorder , the percentage of smokeless/chewable tobacco is more than the smokers. In the current study also 39.2%, 31.1% and 29.7% of the study population used smokeless, smoking and mixed pattern of tobacco which is in accordance with the pattern of use In other Indian studies.

Discussion on Severity of Nicotine Use And Symptomatology Of Depression:

In Our current study, nicotine dependence was found to be associated with symptom severity and outcome with patients with depressive episode. Numerous Cross-sectional and longitudinal studies have indicated significant comorbidity between nicotine use with lifetime depression [5,6, 20,2122,23,24]. Our review of literature found that epidemiologic data, consistent with clinical findings, suggest that depressive symptoms and disorders are associated with higher levels of cigarette consumption, tobacco dependence and appear to be a barrier to smoking cessation.. In addition, our results highlight the potential role of depression in the persistence and intractability of smoking in the general population, again, an impact that is not limited to clinical population. In the present study we attempted to find a relationship between severity of nicotine dependence with symptomatic and remitted patients of depression and difference in severity of nicotine dependence in both the groups is found to be statistically significant and further analysis showed there is a positive correlation between severity of nicotine dependence with symptom severity of depression. In the study, the positive correlation was found between the HAM-D Score which indicated the severity of the depressive episode and the MFTND Combined scores which indicated the severity of nicotine dependence which is in accordance with numerous studies

Discussion on severity of nicotine use with severity of the depressive episode:

HDRS was applied as a method of categorizing patients with current depressive episode and classifying into mild and moderate severity according to the scores obtained. In the current study, there was statistically significant difference between severity of nicotine dependence (combined MFTND) and symptomatology of depressive episode (HDRS) implicating Nicotine dependence was found to be associated with symptom severity of depressive episode.

IMPLICATIONS OF THE PRESENT STUDY

Implications In Direct Clinical Care

The use of tobacco is very common in patients with depression . Depressive Disorder are often disabling in nature, varying in their severity from mild to severe often exhibiting a chronic course that has a relapsing and recurring trajectory over time. and tobacco use, the most common substance use in our population is a major comorbidity with depression. So recognising the severity of nicotine Dependence in Depressive episode may help in "treating both the comorbidities together and help in reducing the mortality and morbidity associated with tobacco use.

Implications For Research

Further research in the area of tobacco use in Depression is necesssary, especially in Indian population. There is need for community-based studies with larger sample size, involving patients of depression with all forms of tobacco. There are many studies in western countries regarding smoking in patients with depression, but in India the predominant form of tobacco that is used more is smokeless form than smoking. So studies need to emphasize on the pattern of tobacco use   and its severity in patients with depression and difference between different forms of tobacco with severity of illness.

LIMITATIONS

1) The external validation of the present study is limited due to the following factors:

   a) The study was hospital based (a tertiary care teaching hospital). Patients who never came to the psychiatric hospital; could be having different clinical characteristics, nicotine Dependence, Stage of readiness to quit.

   b) Excluding the extremes of age groups might have compromised the representation of the general population.

   c) Including only male patients may have compromised the representation of general population.

   d) The sample size was relatively small and only male patients with Depressive episode attending OPD were included, hence the results cannot be generalised for the whole population, general hospital psychiatric unit, patients of in the community and other tobacco users.

2) There was no comparison made with a control group like other psychiatric patients, normal population, patients of depressive episode in Community and other substance use.

3) Tobacco involvement was assessed via self-report only, and such data are subject to recall bias and willingness to report completely and truthfully.

4) The causal association between severity of nicotine dependence and depressive episode could not be studied as it is an observational cross-sectional study.

5) Patients with depression have comorbid multiple substance use. This study has excluded patients using other substances along with tobacco, so whether there is any difference in patients with and without other substance in severity of illness could not be studied.

STRENGTHS OF THE STUDY

1) The study focused on all forms of tobacco use in patients of depression, especially smokeless tobacco users which is the predominant form of use among Indian population, which is as yet an under-studied population in this respect.

2) The tools utilized in the study are the validated ones (HDRS and MFTND) and utilized worldwide

3) The present study focuses upon the severity of nicotine use and symptomatology of depression and only few studies are done in India on it.

4) The study has also focused on the types of depression (symptomatology) which is not done before in India, to the best of our knowledge.

CONCLUSION

1) Majority of the patients of depression used tobacco in the current study.

2) Tobacco use in depression involved use of predominantly smokeless form of tobacco and more than one-third of the patients smoked tobacco.

3) More than half of the patients of the study sample had severe dependence of nicotine.

4) Symptomatic patients of depression have shown more use of tobacco than remitted patients and there is a positive correlation between severity of illness with severity of nicotine dependence.

5) There is a positive correlation between severity of nicotine dependence and severity of depressive disorder

FUTURE DIRECTIONS

1) The present study is a cross-sectional study which focused on the pattern and severity of nicotine dependence in depression patients. For studying the causal association between severity of tobacco use and depression and also the change in the pattern of tobacco use after onset of depression; longitudinal and prospective studies should be designed and undertaken.

2) The present study considered only male patients. Studies could be designed taking both genders of patients in a large sample, so as to give better representation of whole population.

3) The present study took place in an urban tertiary care hospital. Similar studies should be done in rural settings and at community level, so as to give better representation to the rural communities.

4) Studies can be conducted on a large sample of patients for better generalization of results.

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