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AWARENESS AND TOBACCO DEPENDENCY LEVEL AMONG ADOLESCENT PATIENTS VISITING CESSATION CLINIC IN A DENTAL HOSPITAL

Type of manuscript: Retrospective study

Running title:Awareness and tobacco dependency level among adolescent patients visiting cessation clinic in a dental hospital

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ABSTRACT:

Almost 7 million deaths occur per year worldwide due to tobacco addiction. Tobacco causes many oral health complications like tooth stain, periodontal diseases, oral lesions and oral cancer. Adolescents who smoke demonstrate the various smoking behaviours but it is still unclear how dependence develops, manifests and is accurately measured. Hence, the aim of the study is to assess the awareness and to determine the tobacco dependency level among adolescent patients visiting cessation clinic in a dental hospital. The present study is a retrospective study. 86000 patient records were reviewed and analysed from which 300 patients who were adolescents tobacco users are included in this study. Age,gender,type of tobacco, duration and frequency of tobacco usage, Fagerstrom tobacco nicotine dependence was assessed. The data was tabulated and subjected to statistical analysis. The results depicted that 67.7% were smokers and smokeless tobacco was common among 32.2%. Males show the highest prevalence .Majority of them use less than 10 cigarettes per day. Peer pressure acts as a major encouraging factor followed by co-workers and family . More than 50% reported medium dependency level. Significant association was found between the number of years using tobacco and tobacco dependency level($p<0.001$, chi square test). The present study showed that the prevalence of tobacco use and tobacco dependency level is significant among adolescent patients.

***Keywords**: Awareness,Cessation, Adolescent,Tobacco, Dependence*

I. INTRODUCTION:

Tobacco is one of the major public health challenges the world faces today. India is the second largest consumer of tobacco with 267 million users comprising all forms of tobacco. Almost 8 million deaths occur per year worldwide due

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to tobacco addiction. According to WHO, tobacco will cease 30 billion population all over the world within the 21st century from which 80% will be occurring in developing countries(World Health Organization, 2008). Though pharmacological interventions for treating tobacco addiction are highly prevalent in modern science, the consumption is also directly proportional(Harini and Leelavathi, 2019). Tobacco causes many oral health complications like tooth stain, periodontal diseases, oral lesions and oral cancer. Around 80% of the tobacco users are aware of the oral consequences but they still pursue the habit (Prabhakar, Murthy and Sugandhan, 2011; Preethitha sabesan, 2017). It also makes minimal impact on the enamel, dentin and periodontium in each tooth (Mohapatra *et al.*, 2019). The adherence of streptococcus mutans followed by plaque accumulation is increased for adolescents under tobacco use thereby the natural environment in oral cavity is highly influenced (Mathew *et al.*, 2020;Pavithra, Preethi Pavithra and Jayashri, 2019)

Nicotine is present in both smoking and smokeless forms of tobacco(Harsha *et al.*, 2014). It determines an individual's physical and psychological dependence in relation to tobacco (DiFranza *et al.*, 2004; Kannan *et al.*, 2017; Prabakar, John, I. Arumugham, *et al.*, 2018; Prabakar, John, I. M. Arumugham, *et al.*, 2018). When a person attempts to quit smoking, the frequency of nicotine withdrawal symptoms will be very high that makes the person to crave for tobacco furthermore he/she fails to quit smoking. Hence nicotine plays a significant role in tobacco usage. The susceptibility of dental caries is high in the case of adults who consume tobacco(Prabakar, John and Srisakthi, 2016). Studies proved that the prevalence of dependency symptoms is high at the initial stage of tobacco consumption compared to the final stage (Rojas *et al.*, 1998; Kumar, Pradeep Kumar and Preethi, 2017; Samuel, Acharya and Rao, 2020). The occurrence of dependency symptoms acts as a great barrier for tobacco cessation and it varies in each individual(Kumar, Pradeep Kumar and Vijayalakshmi, 2017; Khatri *et al.*, 2019; Neralla *et al.*, 2019).

Comparing all the age groups, adolescents are more vulnerable due to various influences like social environment, socioeconomic status,poor literacy and lack of de addiction centres(Saha *et al.*, 2017). In a study conducted byPratha et al,2019 the salivary pH is highly affected due to increased consumption of carbonated drinks along with tobacco intake(Pratha, Ashwatha Pratha and Prabakar, 2019). About 82000 to 99000 of teenagers begin to smoke each day and also use many forms of tobacco that are available such as cigarettes, Beedi,Paan, Ghutka, zarda,khaini and Hookah.

According to Lamin and Othman, 2014, the nicotine dependency level is higher in those who have started to consume tobacco at the period of adolescence. Many adults who are using tobacco at the present stage are the ones who started this habit at the age of 10 to 15 years and the tobacco dependency level is considerably high among them(Kapoor, Anand and Kumar, 1995). Since they are addicted for a long period of time from 2014 -2017, the process of cessation is also very difficult.

Adolescents who smoke demonstrate the various smoking behaviours but it is still unclear how dependence develops, manifests and is accurately measured. Numerous questionnaires were available to know the exact nicotine dependency level. Although Fagerstrom nicotine dependency questionnaire is a highly consistent and useful tool to diagnose the patient with greater concentration of tobacco, the risk of heavy smoking and it also emphasizes the behavioural aspects of dependence(Heatherton *et al.*, 1991).Hence the aim of the present study is to create awareness and to determine the tobacco dependency level among adolescent patients visiting dental hospital.

II. MATERIALS AND METHODS:

The study is a retrospective analysis of tobacco dependency level among adolescent patients predominantly south indian population. 86000 patient records were reviewed and analysed from that 300 adolescent tobacco(smoking/smokeless) users were included in this study and assessed for age,gender,type of tobacco, duration and

frequency of tobacco usage and dependence based on Fagerstrom tobacco nicotine dependence scale. Patients without any tobacco habits were excluded from the study. Datas were verified manually.

The collected data was tabulated in the excel sheet. The data is imported and transcribed in Statistical Package for the Social Sciences, version 17(SPSS, IBM corporation). Descriptive analyses were based on quantitative variables and frequencies for categorical variables. P value less than or equal to 0.005 was considered statistically significant with a confidence interval of 95%.

III. RESULTS AND DISCUSSION:

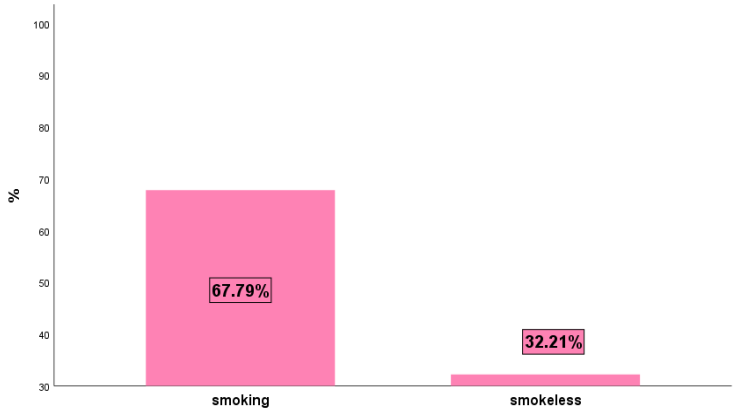

Figure 1 shows the distribution of forms of tobacco used among study participants. X axis represents the type of tobacco and Y axis represents the percentage of patients included in this study. The percentage of smoking tobacco was 67.7%(204) and smokeless tobacco was 32.2%(96). The result was highly significant (t-test; p<0.001)

Gender	Number	%
Male	298	99.3
Female	2	0.7
Total	300	100

Table 1 shows thegender wise distribution of tobacco consumption. It was found that males show the highest prevalence of 99.3%(298) compared with females 0.7%(2). The result was statistically significant (t-test; p<0.001)

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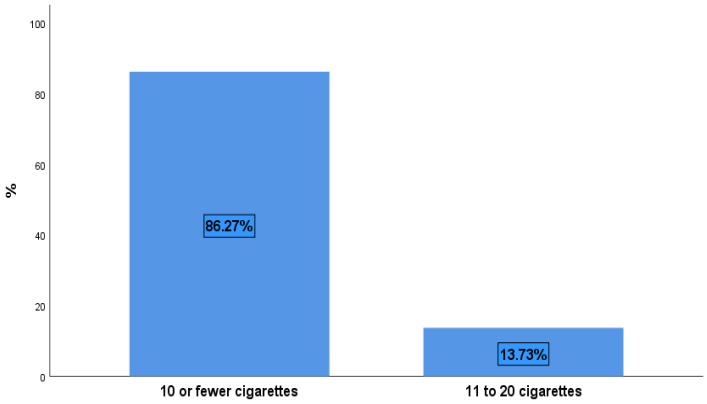

Figure 2 shows the quantity of cigarettes used per day by study subjects . X axis represents the quantity of cigarettes and Y axis represents the percentage of study subjects included in this study. 86.2% (176) of them consume 10 or fewer cigarettes per day and 13.7%(28) consume 11-20 cigarettes per day. The result was not statistically significant (t-test; p=0.002)

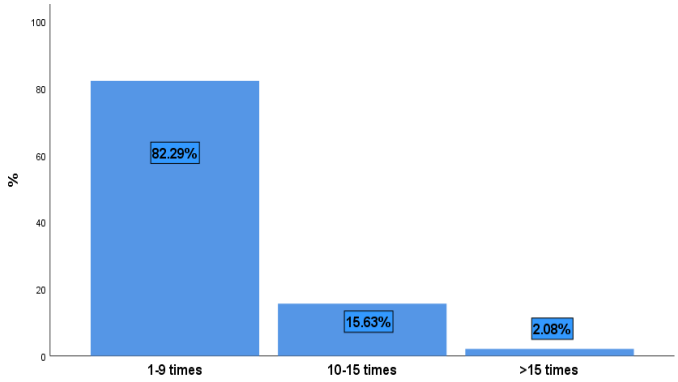

Figure 3 shows the distribution of intake of smokeless tobacco used per day by study participants. X axis represents the frequency of intake of smokeless tobacco used and Y axis represents the percentage of study participants in the study. 82.2%(79) used 1-9 times of dip per day followed by 15.6%(15) used 10-15 times and 2.0%(2) used >15 times. The result was highly significant (t-test; p<0.001)

Hours of chewing/retaining tobacco in oral cavity per day	**Number**	**%**
<14.5 hours	77	25.7
>14.5 hours	21	7.0
Total	98	32.7

Table 2 shows the frequency and percentage distribution of time spent on chewing and retaining smokeless tobacco in oral cavity per day among study participants. From the table, total hours of chew per day among smokeless adolescent patients. 25.7%(77) use for <14.5 hours whereas 7%(21) use for >14.5 hours. The result was not significant (t-test; p=0.003)

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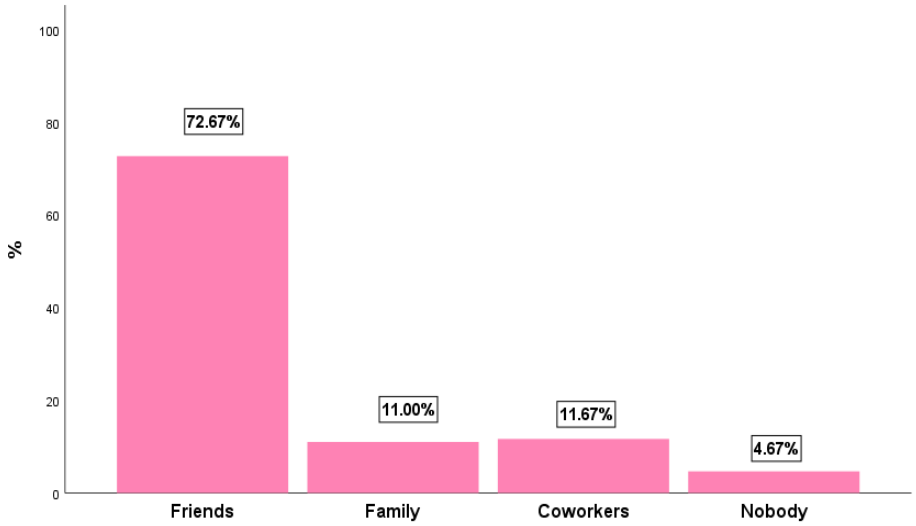

Figure 4 shows the percentage distribution of factors that induce tobacco use among adolescents. X axis represents the distribution of factors that induce tobacco use and Y axis represents the percentage of adolescents in this study. Peer pressure was found among 72.6%(218) followed by co-workers 11.6%(35) and family 11%(33). The result was statistically significant (t-test; p<0.001)

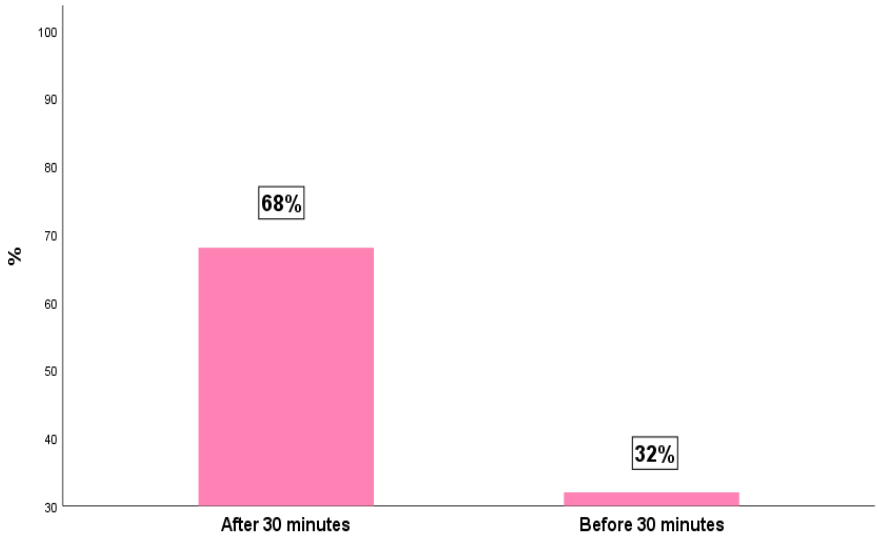

Figure 5shows the distribution of time of first tobacco after waking up (<30 mins) among study participants of tobacco use. X axis represents the time of first tobacco use after waking up and Y axis represents the percentage of study participants. The percentage of tobacco use after 30 minutes was 68% and before 30 minutes was 32%. The result was statistically significant (t-test; p<0.001)

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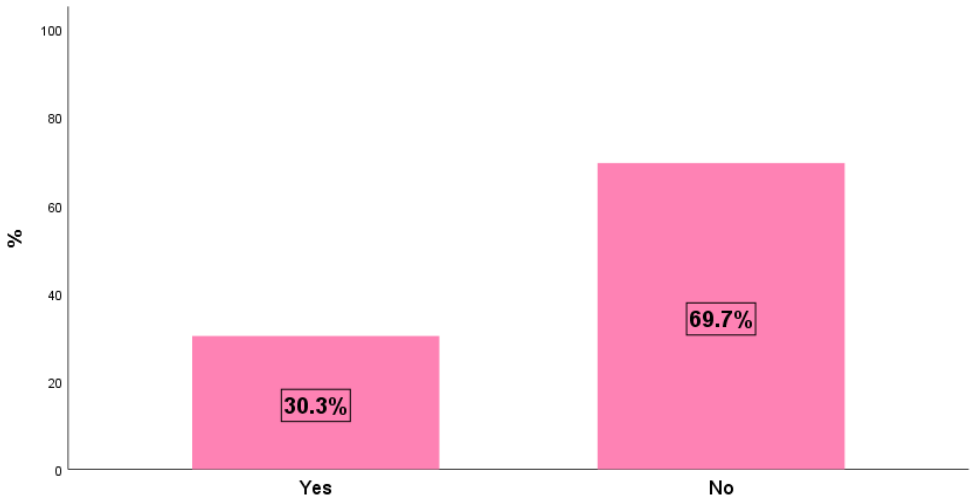

Figure 6 shows the percentage of tobacco usage during periods of illness among study participants. X axis represents the tobacco use during sickness and Y axis represents the percentage of study participants. Around 30.3% used tobacco even during periods of illness. The result was not significant (t-test; $p<0.05$)

Duration of tobacco habit	**Number**	**%**
<1 year	90	30.0
1-2 years	118	39.3
2-3 years	48	16.0
> 3 years	44	14.7
Total	300	100

Table 3shows the total number of years under smoking/chewing tobacco. 39.3%(118) mentioned 1-2 years , 30%(90) with <1 year, 16%(48) with 2-3 years and 14.7%(44) with >3 years. The result was not significant (t-test; $p<0.05$)

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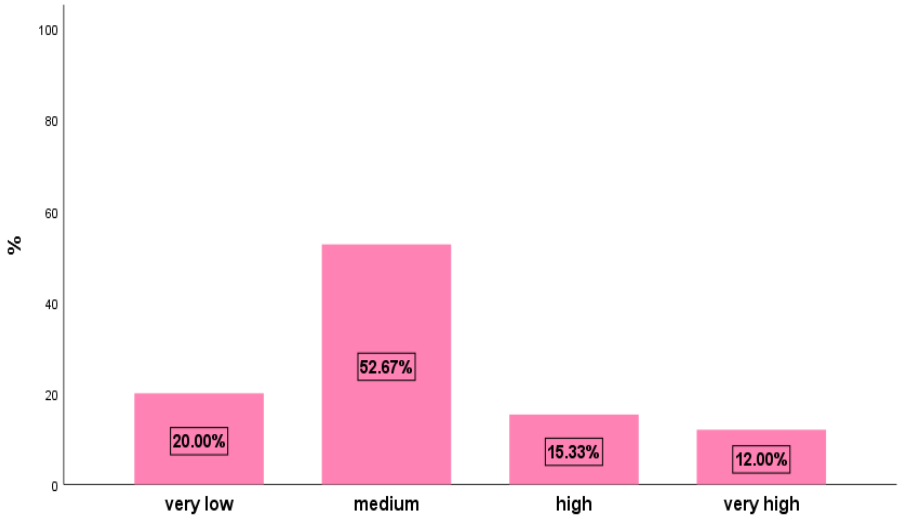

Figure 7shows the distribution of tobacco dependency level among study subjects. X axis represents the tobacco dependency level and Y axis represents the percentage of adolescents in the study. Here, 52.6% reported medium dependency level, 15.3% with high dependency,20% with very low dependency and 12% with very high dependency. The result was statistically significant (t-test; p<0.005)

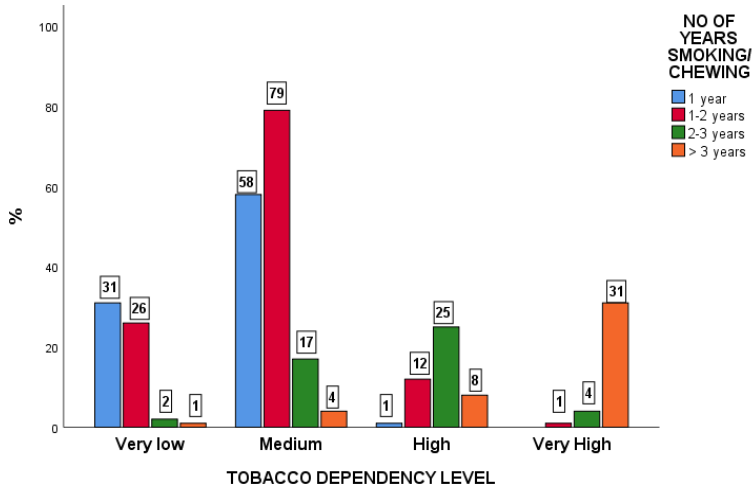

Figure 8 shows thecorrelation between distribution of tobacco dependency level and number of years smoking or chewing tobacco. Blue colour denotes 1 year, red denotes 1-2 years, green denotes 2-3 years and orange denotes >3 years. It was found that patients with an increased number of years under tobacco use showed more dependency level. The result was statistically significant (chi-square test; p<0.005).

In the present study, smoking is more prevalent than smokeless tobacco use which is similar to previous study conducted by (Saha *et al.*, 2017) and Kandel et al, (Kandel *et al.*, 2007). In developing countries like India, smoking type of tobacco is highly consumed. Both the types of tobacco are consumed by people predominantly with low socioeconomic status, illiteracy, and stressful family background. In contrast, a study conducted by Janeshwar et al, reported smokeless tobacco is common as it is helpful in minimising the negative emotion and provides pleasure by chewing at the crucial time compared to smoking(Janeswar *et al.*, 2019). Some studies show dual use of tobacco that is both smoking and smokeless in which youth start with smokeless type and slowly/rapidly progress to smoking

tobacco which can be e-cigarettes,bidi or hookah depending upon the population and socioeconomic status(Wiener and Constance Wiener, 2013).

In the current study males are more prevalent than females. Similar findings were seen with prajapati et al,where males showed prevalence of 78%(Prajapati *et al.*, 2017). Males usually show easy susceptibility with peer pressure particularly at the college age and initiation of a job. Experience and behavior during these formative years can influence lifelong health, as well as put current health at risk. In contrast,(Rani, 2003) and (Csibi *et al.*, 2019) in their study proved female predilection with a prevalence rate of 62.5% and 58.8%. But both the studies were conducted only with limited sample size.

The result of the present study showed the majority of adolescents consume >10 cigarettes per day.In a similar study showed 9 or fewer cigarettes were averagely consumed by daily users with moderate dependence symptoms (Kandel *et al.*, 2007). They are at a high risk of health problems such as coronary heart disease, lung disorders, stroke and hypertension. Those category adolescents can either be extremely responsible about life or completely ignore their life. As an adolescent, they consume high amounts of cigarettes in a slow or rapid onset depending upon the reason for which they have initiated their smoking habit and its progression (Pandya *et al.*, 2019).

On assessing the frequency of chewing or retaining smokeless tobacco in the oral cavity per day, the majority of them used it for 1-9 times. The result is in line with the study conducted by (Cheng *et al.*, 2017) which reported an average frequency of 9-11 times per day. Initiation of chewing tobacco among adolescents is to create a mature good looking image in the public and additionally to get the macho feeling as mentioned by Che Lamin et al in their study(Lamin, Othman and Othman, 2014).

The Fagerstrom Tobacco Nicotine Dependence scale showed 7% of them continue to chew tobacco for >14.5 hours and they show increased physical dependence. They keep it as a pouch in the buccal mucosa of the oral cavity for a prolonged time. Since they act as flavouring agents , they favour keeping it in their mouth. Due to the above reasons, the susceptibility to oral lesions like leukoplakia, oral submucous fibrosis is more compared to smoking tobacco. None of the contradictory findings is seen or mentioned about the total time of chewing tobacco per day.

Adolescents tend to spend most of their time with friends rather than family . An adolescent non smoker as a result of peer pressure tends to become addicted to tobacco use. According tokleinjen et al, adults assume society respects them and look at them if they use cigarettes/gutka in front of others(Kleinjan *et al.*, 2012). According to Che lamin et al, about 77.2% of the smokers are encouraged by their friends which is similar to the current Study. Those who are socially dependent utilise tobacco not because of nicotine craving, but to manage social situations and maintain a social connection(Johnson *et al.*, 2003).Consumption among family members seems to influence the adolescents greatly. In the study of Chadda et al,68.2% of the family members (father, grandfather or siblings) were regular smokers, whereas in the case of non-smokers this percentage lowered to 18.36%(Chadda and Sengupta,

2003).They find it very comfortable when they get influenced by their own family. According to thakur et al, many adolescents start smoking at the beginning of their job and continue into middle age(Thakur and Paika, 2018).

In the study conducted by Fu et al,the first cigarette between 6–30 min (35.7%) and >60 min (34.8%) after waking up was reported which is in line with the present study(Fu *et al.*, 2011). Another study reported that 68.5% of them using their first cigarette within 30 minutes and mentioned the craving for the first cigarette in the morning is one of the common physical dependence symptoms(Heatherton *et al.*, 1991).Studies also prove salivary cotinine level is high among those who smoke within 6-30 minutes i.e shorter the duration of first cigarette,higher the cotinine level(Fu *et al.*, 2011). Another study also proved strong association of first cigarette and craving symptoms(Kleinjan *et al.*, 2012).

In the current study, 30.3% consumed tobacco even during sickness. The teenagers find themselves getting refreshed and to recover fast from bed. They develop craving and symptoms even during illness. A significant association was found between the number of years smoking and tobacco dependency level($p<0.001$, chi square test). The study conducted byCsibi et al, reported the average number of years smoking is 0-7 years and most of the adolescents smoked for 1- 2 years and show very low to medium dependence which is consistent compared to present study(Csibi *et al.*, 2019).

From the study, 52.6% showed medium dependency followed by 20% with very low dependency. Medium dependency comprises the score of 3-5 according to FTND. This is similar to the study bySaha et al ,88.6% showed anaverage score ranging from 4.2+- 1.5 representing medium dependency level(Saha *et al.*, 2017) but it is not statistically significant. Significant increase in dependency level is observed among college going students(Jayakrishnan *et al.*, 2012). In contrast, Robert et al, reported a higher score of 5+- 2 among adolescents(Roberts *et al.*, 2013). In contrast to the present study, (Lamin, Othman and Othman, 2014)reported very low nicotine dependence among undergraduate students.

IV. CONCLUSION:

Within the limits of the study, adolescent males show medium dependency to tobacco use. Besides the type of tobacco consumption, all forms of tobacco highly affect the general and oral health. It is recommended to enforce rehabilitation and counselling centres must be evolved to safeguard the adolescent patients from tobacco dependency. Both public and private sectors must participate to make it accessible to all adolescents. Awareness must be created to educate them regarding the consequences of tobacco use. Young generation is the future hands of a nation's development. So they must be made to understand their responsibility towards their life.Since this is a matter of great public health concern, every individual must take part to make a tobacco free nation.

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