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Effect of Smoking Behavior on Nicotine Dependence Level among Adolescents

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Abstract

Smoking prevalence among adolescents caused by addiction has risked the population's health. The purpose of this study was to investigate the effect of the nicotine dependence level among undergraduate students that practised cigarette smoking since adolescence. We distributed questionnaires that are related to smoking history, smoking habits and Fagerstrom Test for Nicotine Dependence (FTND). The findings showed that 58% of students have very low nicotine dependence and 19% of smokers have low nicotine dependence. While moderate and high nicotine dependent were 18% and 5% respectively. Smoking habits are the main factors that contribute to the nicotine dependence level and quality of life.

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Keywords: Smoking; adolescence; Fagerstrom Testfor Nicotine Dependence (FTND); addiction

1. Introduction

Cigarette smoking is one of the major causes of many diseases world widely (Benowitz 2010). Smoking prevalence among adolescents is a widespread behavior and also a major issue discussed all around the world. A study by the United State Department of Health & Human Services (1994) indicated that nicotine dependency was greater in those who have started smoking since adolescence than those

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who started smoking during adults. Many researchers from all around the world have reported that individual who smoke are likely to have begun and established smoking habit during adolescence. It was not a surprise when more than 80% adult smokers started smoking before the age of 18 years (Substance Abuse & Mental Health Services Administration, 2009; Johnson et al 2003; Young 2005; Dieker at al 2007). According to the survey conducted by Spilková and Dzúrová (2012), most of students in Czech have changed their lifestyles. Their perception on cigarette smoking, alcoholism and drug abuse tend to be a norm. This study was to investigate the relation between FTND level and smoking behavior among university students in Penang, Malaysia. The approach of this research was to study the respondent's history on the influence of psychosocial and psychological to the age of starting smoking. It was important to know what are the factors or reasons for engaging in the smoking behavior among adolescents in Malaysia. The study of smoking prevalence among university students in Malaysia is quite limited. So we conducted this cross sectional study for a better understanding of smoking behavior among students. We managed to gather 57 smoking students to participate in this study voluntarily.

2. Literature review

Smoking leads to tobacco addiction, which cause is the major worldwide health problems that contributes to cancer, cardiovascular disease and respiratory diseases. It is estimated that of five million of people worldwide died of smoking-related diseases every year (World Health Organization 2005). Nicotine has a pharmacological effect that plays a crucial role in tobacco addiction. Tobacco mediated the actions of the tobacco dependency by delivering nicotine in the central nervous system essentially. Usually the concept of tobacco dependence specifically refers to physical dependence on nicotine. In this context tobacco dependence frequently referred to nicotine dependence or addiction. Even though the basis of nicotine addiction respites its effects on the brain, other agents like genetics, experience or conditioned factors, social and environmental conditions may be the influencing factors of the addiction. It explains how nicotine induces pleasure, reduces stress and anxiety (Benowitz 2010).

Fagerstrom Test for Nicotine Dependence or FTND is the most noteworthy ranges to determine the dependency level in a clinical and research setting (Li & Burmeister, 2009). The development of FTND was to assess the level of tobacco dependence from a physical perspective (Heatherton et al. 1991). This is a useful guide to making match treatments to individuals on the basis of the extent of the physical dependence. There are six items assessing different aspects of smoking behavior such as the number of cigarettes smoked per day and the time after awaking when the first cigarette is lit (Dijkstra & Tromp, 2002). The development of FTND was to comply to adolescent questionnaire adjustment. The FTND has shown better reliability and validity among adolescents, compared to the Fagerstrom tolerance questionnaire (FTQ) (Prokhorov et al. 1998). According to Prokhorov et al (1998), FTQ which is not a unidimensional scale and the internal consistency was 0.54.

3. Methodology

We conducted this study in two universities in Penang State. We distributed a set of self- administered questionnaires the validated to the undergraduate students to gather demographic data, smoking history, the current smoking habits and FTND level. To determine the smoking status among the participants, we used the definition from the World Health Organization (1996). The definition of a smoker by the World Health Organization (1996) is who have smoked at least 100 cigarettes or more in their lifetime. We collected and analyzed the data using SPSS version 20.

4. Findings

57 smokers have voluntarily participated in this study. All of the respondents are male. The age ranges of the respondents were 18 to 24 year-old students. All of the respondents are undergraduates. The percentage of students from pre-diploma, diploma program, and bachelor program are 10.5%, 49.1% and 40.4% respectively.

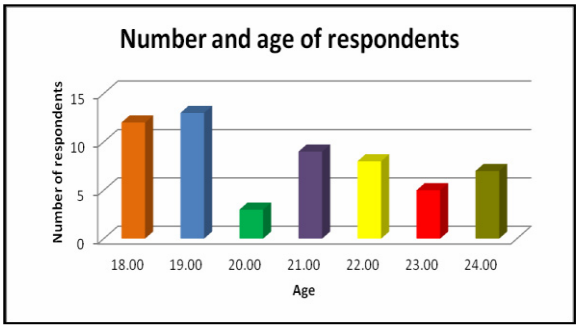

Fig . 1. Number and age of respondents who participated in this survey

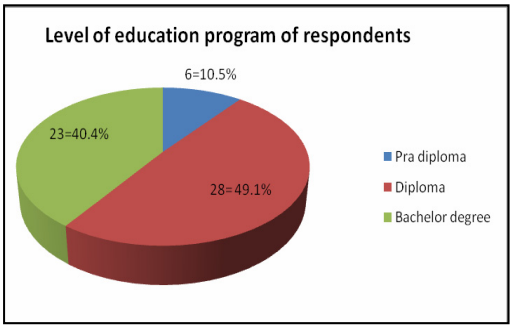

Fig . 2. Respondent's education program

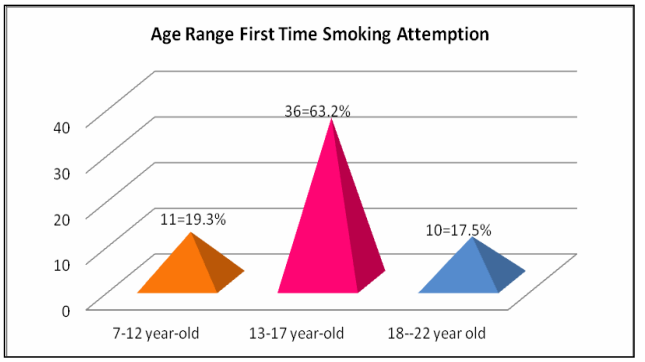

Fig . 3. Respondent's age range of first time smoking attempt

Figure 3 showed that 63.2% of respondents started their first cigarette during at secondary school or adolescence phase. About 19.3% of respondent have admitted that they have been smoking since their childhood or at primary school. Whereas 17.5% of respondents started smoking since they are studying at college or university. Generally, almost 82.5% of smokers in this study have committed with smoking habits before the age of 18 years. This finding was agreeable with Substance Abuse & Mental Health Services Administration (2009). This literature reported that 80% of adult smokers begin smoking before the age of 18 years and established a smoking habit during adolescence.

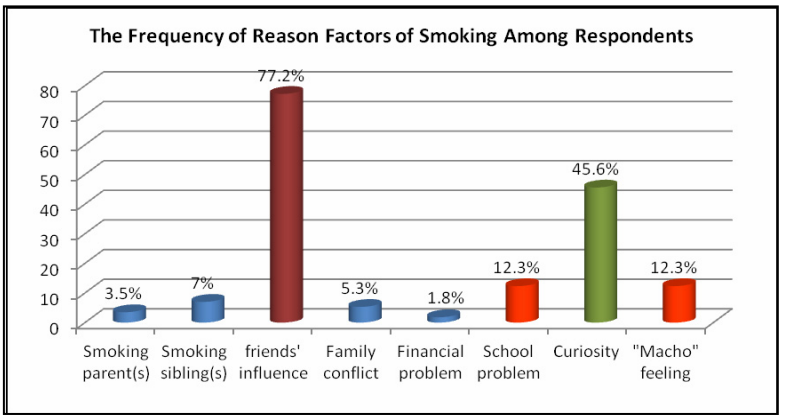

Fig . 4. List of reason factors and the frequency of smoking among respondents

We listed 8 possible factors to investigate why these adolescents smoked at the first time. Figure 4 showed that peer pressure contributed 77.2%, which is the highest number of smoking factor among the respondents. Meanwhile, 45.6% of the respondents started smoking due to their curiosity instinct driven. About 12.3% of the respondents claimed that they smoked because they wanted to become “macho” or having manly characteristic. Having problems at school was the third prominent reason of why they smoked at the first time. While other four reasons, smoking parent(s), smoking sibling, family conflict and financial problems contributed 3.5%, 7%, 5.3% and 1.8% respectively.

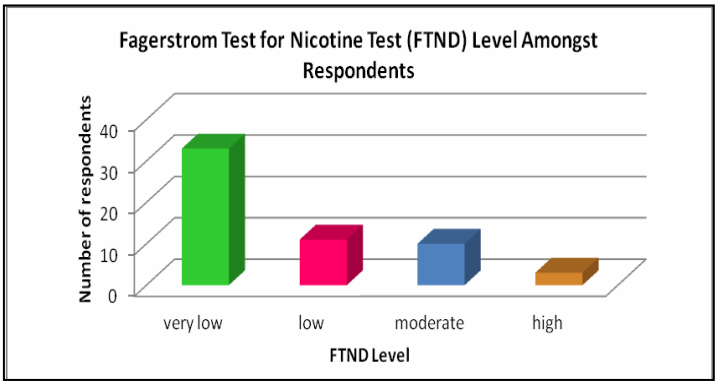

Fig .5. FTND level among respondents

We used FTND score scales to measure the level of nicotine dependency among students. According to Heatherton et al. (1991) there were 5 classifications of dependence. Very low dependence was stated with the score (0-2), low dependence (score value 3-4), moderate (score value 5), high dependence (score value 6-7) and very high dependence (score value 8-10). 58% of smokers have very low nicotine-dependent while 19% of smokers have low nicotine-dependent. The percentages of moderate and high nicotine dependence were 18% and 5% respectively. None of the respondent was categorized as a very high dependency. In this study smoking behavior among the university students was one of the main objectives. There were 12 probabilities of student’s smoking preference. The respondents needed to self-rating the frequency of their smoking habits by using 4 scales. The scales, then were rated as never, seldom, always and every time. The 12 probabilities of the smoking situations criteria and the rated scales

could give the information on how the student's campus lifestyles associated with their smoking behavior. Figure 6 illustrated the preference of smoking habits among the respondents and the highest frequency from the four rating scales (never, seldom, always and every time). Figure 6 showed that nine situations that "always" stimulate the students to smoke. The nine identified situations: they were thinking of a cigarette, after taking the meal, seeking for ideas, in pressure condition, feeling bored and finally when they were with their peers. In this study, the phrases "I smoked when I was thinking of a cigarette" and "I smoked in the morning" were to indicate whether have the addiction or craving of cigarettes. Cigarette craving in the morning is one of the nicotine dependence symptoms (Heatherton et al. 1991). About 66.7% of respondents admitted that they will "always" smoke when they have the desirability to smoke but they can control the addiction. Only 50.9% of respondents claimed that they "seldom" smoked in the morning time. Agreeing with the previous outcomes, the majority of the respondents have low nicotine dependence.

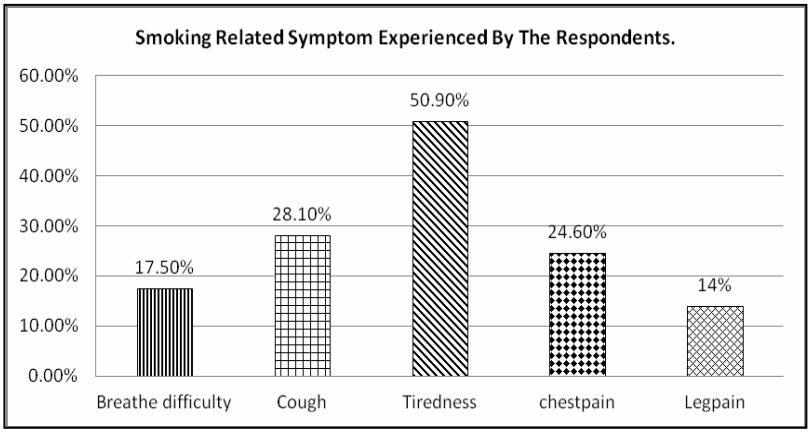

Fig . 6. Smoking behavior among respondents and their preference

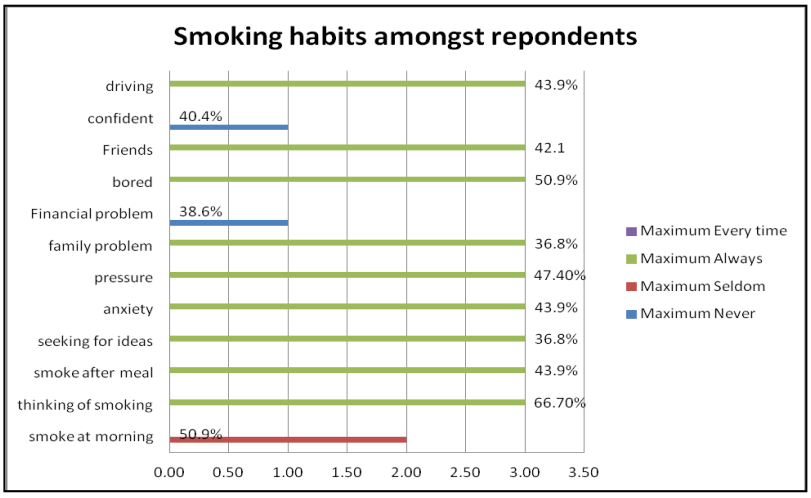

Fig .7. Smoking related symptom complained by the respondents

There are studies on the cigarette smoking health impact and well-being of populations. To assess the effects of smoking prevalence among the students they need to self report on 5 smoking related-pain symptoms. In general, breathe difficulty, cough, chest pain and tiredness were the most lung disease association symptoms (Eton et al. 2007). Whereas leg pain radiated from back pain has a significant association with active smoking (Pisinger et al. 2011). Figure 7 showed that 50.9% of respondents experienced the tiredness symptoms. Cough and chest pain symptom occurrence were notified as 28.1% and 24.6% respectively. About 17.5%t of the respondents complained of breathing difficulty and least was complaining of leg pain (14%). From the logistic regression analysis, FTND was not significantly related to any of the listed symptoms because in our case the majority of FTND level was categorized as very low and low dependence.

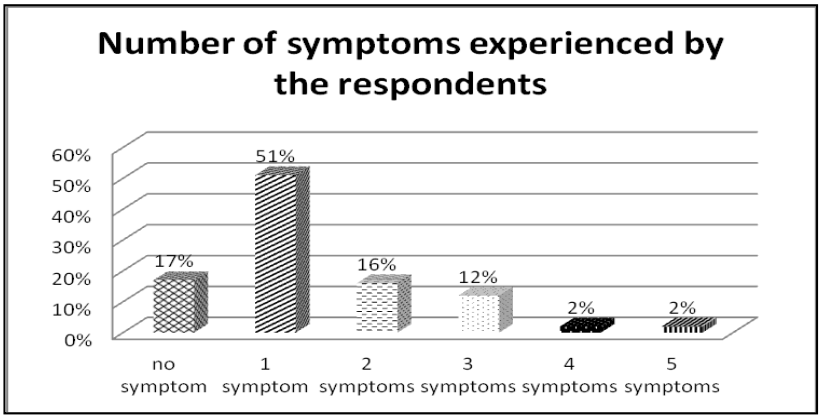

Fig . 8. A number of symptoms experienced by the respondents

Despite of FTND was not significantly related to any of the listed symptoms, however, more than 32% of respondents were suffering with more than one symptom. Result from figure 8 showed that 17% of the respondents didn't have any sign of the symptom. Most notably, 51% of the students realized that they are having the smoking related symptom. The percentage of students that experienced any two kinds of smoking related symptoms was 16%. The percentage was slightly lower for the combination of three symptoms and the figure approximately around 12%. It wasn't a surprise when 4% of the respondents complained of having four and five combinations of smoking related symptoms. Regarding to the matter, this outcome was consistent with the previous observation that 5% of the respondents were classified as high level of nicotine dependence.

5. Discussion

Johnson et al. (2003) suggested that tobacco dependence among youth, described that the first attempts at smoking as requiring cigarettes in order to function socially. In youth social context it was important for them to smoke with or in front of their peers. It was a process of social identification or self-categorization to seek acceptance. The reasons of smoking for youth always associated with curiosity, peer pressure or influence from the same or different sex, stress about study or school and the isolation (Young 2005). Findings from this study indicated that smoking prevalence among parents and sibling also promoted pro-tobacco social environment for youth to smoke. Even though smoking prevalence probability among the adult and siblings may influence 10.5% of the adolescents, smoking behaviors

among family members were the key social factors influencing uptake in tobacco use. Previous study illustrated that those who have been smoking since adolescence showed a greater degree of nicotine dependency than do those who started smoking as adults (U.S. Department of Health & Human Services, 1994). From the survey, obviously the respondents have started smoking during adolescence, but the majority of nicotine dependence levels were very low and low. This is because most of the respondents smoked when they were at secondary school (aged 13 to 17 year-old student). Currently, the respondents now are at the university level (18 to 24 year-old student). Their smoking duration was, on average, 5 years or below than 5 years. From the bivariate correlation analysis, the result showed that there was no significant correlation between age at start smoking and the level of FTND. This may be due to the short period of smoking exposure.

According to DiFranza et al. (2000), they hypothesized that there may be different trajectories of emerging dependence. The trajectories were the rapid onset, slower onset and those who are resistant. Based from their findings on an American 7th grade student cohort, 22% of youth experienced the physical symptoms of tobacco dependence rapidly within 4 weeks of the smoking initiation. About 62% of these students experienced the symptoms, although they were non-daily smoker. These findings emphasized the conception that tobacco dependence emerges over the time. Beside that maybe there are a lot of contributing factors such as different personality and environmental that accounted for its emergence. Unfortunately, there is limited information on smoking frequency that essential to result in the nicotine dependence.

From our findings, the boredom, depression and anxiety which parts of the negative moods have affected 50.9%, 47.4% and 43.9% of students to smoke respectively. Looking into their routine life, about 42.1% of respondents said that they will “always” smoke when they were hanging out with their friends. The respondents categorized this smoking habit as a part of their social needs. While 43.9% of respondents declared that smoking after taking the meal and during driving as their “always” habits. It was difficult to resist for 36.8% of the respondents that they will smoke when they were seeking for ideas and facing with the family crisis. Many college students smoke because they believe it helps them to find ideas during their study association with to release their stress. It was quite impressive findings when 40.4% of respondents claimed that “never” smoked where they were in the circumstances when their confidence level needs to be sustained. For about 38.6% of students will take the approach “never” smoked or not to buy the cigarettes and smoke when they were facing financial problems.

To measure the dependency pattern of the smoking related symptom among these young smokers, we run the bivariate Spearman’s rho correlation coefficient (r). The data analysis from these non-continuous paired variables showed that only chest pain symptom was significantly related to cough symptom. The correlation coefficient (r) value for these two symptoms was 0.278 and positive. The strength of this relation is weak and positive, Therefore, this indicated that one’s will suffer more because the chest pain increase will cause coughing symptom worsen. Even though the FTND was not the main cause of the presenting symptoms, this statistic is useful to predict their health status with the prolong of smoking prevalence. These symptoms developed among young adult smokers may give the impact on the student’s routine activities and quality of life.

5.1. Regression study on student’s smoking behavior and FTND level

The estimated proportion of variance in the nicotine dependency level of 12 student’s smoking habits, was performed by a standard multiple regression analysis. In combinations of 12 smoking habits 60% of the variability in FTND level were significant with $R^2 = 0.63$, adjusted R^2=0. 53, F (12,44) = 6. 3 and p=0. 000. From the table 1, student’s smoking habits in the morning was the most significant behavior in

affecting the FTND level with $p<0.001$. Here, sr^2 indicating that around 3.2% of the variance in FTND level can be uniquely attributed to smoking in the morning.

Table 1. Unstandardised (B) and Standardized (β) Regression Coefficients and significant and Squared Semi-Partial Correlations (sr^2) For Each Predictor Smoking habits in Regression Model Predicting the Level Of FTND.

Variables	B	β	Sig.	sr2
Smoke in the morning	.860	.808	.000*	0.324
Thinking of smoking	-.198	-.136	.306	0.007
Smoke after meal	-.017	-.072	.496	0.003
Seeking of ideas	-.292	-.292	.083	0.031
Anxiety	-.031	-.031	.801	0.000
Pressure	.270	.252	.097	0.035
Family problem	.069	.076	.594	0.001
Financial problem	.081	.086	.601	0.003
Boredom	.020	.017	.899	0.000
Friends	.089	.077	.539	0.003
Confident	-.012	-.011	.938	0.000
Driving	-.070	-.065	.651	0.004

($p<0.001$)

5.2. Correlation analysis between smoking predictors and FTND level

Table 2. Correlation Coefficient between 2 variables

Correlation between 2 variables	Correlation Coefficient	P value
FTND and number of cigarettes per day	0.720	0.000**
Current smoker and smoking family background	0.356	0.007**
Age of start smoking and smoking family background	0.171	0.201
FTND and smoking family background	0.221	0.098
FTND and Age of start smoking	-0.139	0.302

** Correlation is significant at the 0.01 level (2-tailed)

Table 2 showed the linear relationship between FTND and the number of cigarette per day among the respondents. From the analysis, the outcomes were a strong and positive correlation between FTND and the number of cigarette per day with the correlation coefficient, $r(55) = 0.707$. This result explains that the higher number of cigarette per day the level of FTND will also increase. Supported by Dieker et al. (2007) they presented a positive association between smoking and nicotine dependence was showing higher prevalence of dependence with higher levels of use among first year college students.

While the results in table 2, showed that smoking family background and age at started smoking were not affecting the level of FTND or the influence factors of nicotine addiction ($p>0.05$). To study the linear relationship between smoking family background and respondent's smoking status, we performed the analysis of the bivariate Pearson's correlation coefficient (r). The bivariate correlation between these two variables was positive and moderate with $r(55) = 0.356$ and $p<0.01$ as shown in the table 2. Therefore, this relation explained that it is sensible for a person to become a smoker if their family member also the smoker. While a bivariate correlation analysis indicated that smoking family background has a weak

influence on a person to initiate smoking, or r(55) = 0.171 and statistically not significant (p>0.05). Based from our results, 9% adolescents claimed that they are non-smoker as defined and their family also not smokers. While, 5% others adolescents were non-smokers as defined, but they have the smoking family members. On the other hands, 16% adolescents were the smokers, even though none of their family member was smokers. As presume in our findings, 70% adolescents who were smokers also have smoking family background.

5.3. Research limitation

Unfortunately, this study only discovered the smoking behavior among male students. We are aware of the existence of smokers among female students. It was so difficult to get them involved in this study. From our conversation, generally they feel shy to admit that they are smokers. We were also facing the problem to get the respondents from the postgraduate program because most of them were out of campus.

6. Conclusion

At the conclusion, we have discovered that most university students started smoking during adolescence because of their peers followed by curiosity instinct and due to "macho" feeling. A majority of university students in this study dominated the category of very low nicotine dependence. The student's FTND level highly related to the number of cigarette that they smoked every day and the smoking habit in the morning. Most of the students were expecting smoking to alleviate the negative mood, such as stress, anxiety and crisis. In addition, enjoyment of smoking after meals, during driving, boredom, hunt for inspiration and desire for social acceptance are also commonly cited reasons for smoking. Social networks may influence people to smoke. In order to assess the risk of being influenced to become a smoker, the results showed that smoking family background or members have moderately influence on the individual. Based on the findings from this study, we emphasized those adolescents, especially secondary school students are the vulnerable group of cigarette smoking influence. Finally, considering to the health status, the sign of illness has been developed among these young smokers. Smoking can result in health implication and risk factor in influencing one's quality of life.

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